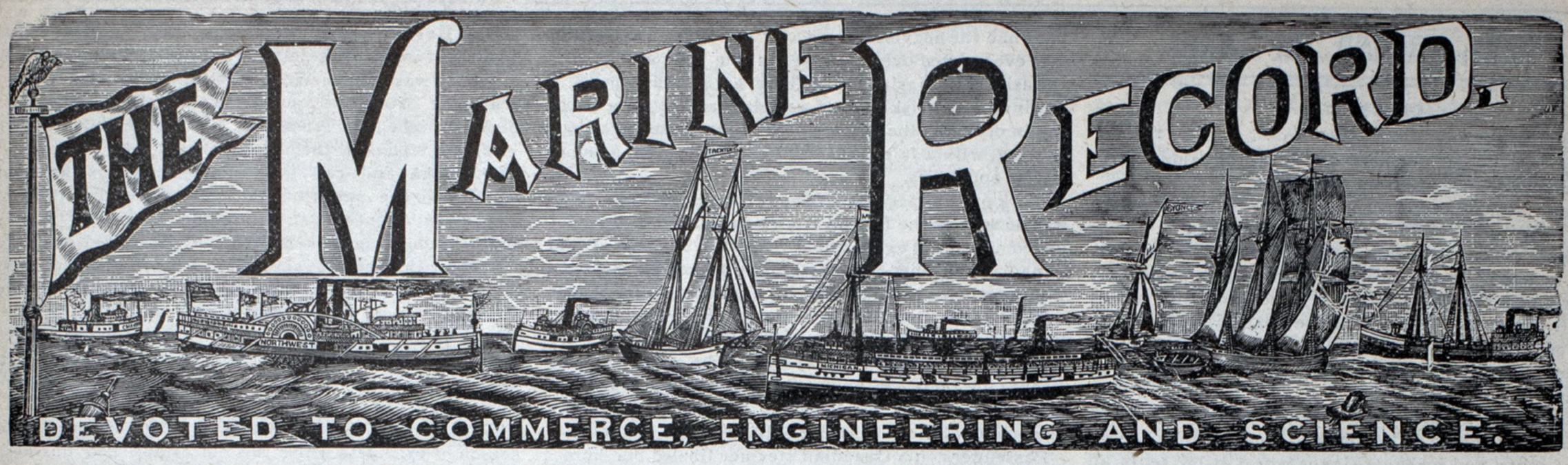


$2.00 PER YEAR. ESTABLISHED 1878. 10c. SINGLE COPY.

VOL. XVII. CLEVELAND, OHIO, AUGUST 30, 1894. NO. 35

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

PRESIDENT:
JAMES CORRIGAN, - - Cleveland, Ohio.

SECRETARY:
CHARLES H. KEEP, - - Buffalo, N. Y.

TREASURER:
GEORGE P. MCKAY, - Cleveland, Ohio.

COUNSEL:
HARVEY D. GOULDER, - Cleveland, Ohio.

VICE PRESIDENTS:

E. M. PECK,	Detroit.	GEORGE G. HADLEY,	Toledo.
WASHINGTON BULLARD,	Buffalo.	H. A. HAWGOOD,	Cleveland.
J. S. DUNHAM,	Chicago.	JAMES MCBRIER,	Erie.
A. B. WOLVIN,	Duluth.	DAVID VANCE,	Milwaukee.
C. A. EDDY,	Bay City.	F. J. FIRTH,	Philadelphia.

COMMITTEE ON FINANCE:

H. M. Hanna,	Cleveland, Ohio.	D. C. Whitney,	Detroit, Mich.
H. H. Brown,	Cleveland, Ohio.	W. P. Henry,	Buffalo, N. Y.
James Corrigan,	Cleveland, Ohio.	J. H. Brown,	Buffalo, N. Y.
H. A. Hawgood,	Cleveland, Ohio.	David Vance,	Milwaukee, Wis.
Thomas Wilson,	Cleveland, Ohio.	R. P. Fitzgerald,	Milwaukee, Wis.
M. A. Bradley,	Cleveland, Ohio.	John G. Keith,	Chicago, Ill.
J. C. Gilchrist,	Cleveland, Ohio.	J. S. Dunham,	Chicago, Ill.
E. M. Peck,	Detroit, Mich.		

COMMITTEE ON AIDS TO NAVIGATION:

David C. Carter,	Detroit, Mich.	W. M. Egan,	Chicago, Ill.
H. S. Hodge,	Detroit, Mich.	Frank Owen,	Ogdensburg, N. Y.
George P. McKay,	Cleveland, Ohio.	A. W. Colton,	Toledo, Ohio.
H. G. Dalton,	Cleveland, Ohio.	James Davidson,	Bay City, Mich.
B. L. Pennington,	Cleveland, Ohio.	Alvin Neal,	Port Huron, Mich.
W. C. Richardson,	Cleveland, Ohio.	E. T. Evans,	Buffalo, N. Y.
Thomas Wilson,	Cleveland, Ohio.	Washington Bullard,	Buffalo, N. Y.
John W. Moore,	Cleveland, Ohio.		

COMMITTEE ON LEGISLATION:

S. D. Caldwell,	Buffalo, N. Y.	Wm. Livingstone, Jr.,	Detroit, Mich.
James Ash,	Buffalo, N. Y.	James Millen,	Detroit, Mich.
E. T. Evans,	Buffalo, N. Y.	Jesse Spaulding,	Chicago, Ill.
P. P. Miller,	Buffalo, N. Y.	C. A. Eddy,	Bay City, Mich.
John Gordon,	Buffalo, N. Y.	Alex. McDougall,	Duluth, Minn.
Wash. Bullard,	Buffalo, N. Y.	W. S. Brainard,	Toledo, Ohio.
H. M. Hanna,	Cleveland, Ohio.	F. J. Firth,	Philadelphia, Pa.
James Corrigan,	Cleveland, Ohio.		

COMMITTEE ON INSURANCE:

W. S. Mack,	Cleveland, Ohio.	John Rice,	Buffalo, N. Y.
H. A. Hawgood,	Cleveland, Ohio.	Edward Smith,	Buffalo, N. Y.
J. C. Gilchrist,	Cleveland, Ohio.	W. S. Brainard,	Toledo, Ohio.
J. T. Hutchinson,	Cleveland, Ohio.	W. M. Egan,	Chicago, Ill.
A. A. Parker,	Detroit, Mich.		

THE SEALING QUESTION.

The state department has initiated the next phase of the sealing question by addressing a note to all maritime powers inviting them to adhere to the agreement reached by the United States and Great Britain relative to the protection of the seal fisheries in the Bering sea. This was made necessary by the award of the Paris arbitration, which found that the United States had no exclusive jurisdiction over the seal waters and that these could be protected only by mutual agreement. By the terms of the treaty submitting her case to arbitration Great Britain was bound to agree to the arrangement as to close seasons and closed zones imposed by the arbitration tribunal. This, of course, could have no effect upon other nations, and vessels sailed under the flags of Germany, France, Russia, Sweden or even Hawaii were left by the award free to prey upon the seals anywhere outside of the three-mile limit from the Alaskan shores and islands. To meet this the tribunal recommended that an effort be made to secure the adhesion of other maritime powers to the same arrangement that bound Great Britain and the United States. It is true that seal herds have not suffered much as yet from the operations of the sealers of these nations, but there were indications that certain enterprising merchants were making ready to conduct a raid on the seals under other flags than our own and Great Britain, notably the Hawaiian and German flags, and it was felt to be the prudent course to avoid any disagreeable incidents in the future by securing the adhesion of the remaining maritime nations to the agreement. The United States already has a *modus vivendi* with Russia, by the terms of which the sealers of each country are prohibited from infringing on the seal waters of the other, and as Japan has extensive seal rookeries on her own coast, it is believed that these two nations at least will accept the invitation, provided the agreement is mutually protective. With Hawaii, anxious as she is to retain the good will of the United States, no difficulty is anticipated, so that the probabilities are, as already outlined in the dispatches, that the closed zone, now bounded on the west by the 180th degree, will be extended so as to include the entire North Pacific ocean north of San Francisco, as well as Bering sea.

DYNAMITE GUNS NOT FIT FOR SHIPS.

The transformation of the dynamite cruiser Vesuvius into a torpedo catcher which was delayed in order to profit by the experiments now being made with the new dynamite guns at Sandy Hook, will at once proceed, according to the original plan. Capt. Sampson, chief of the ordnance bureau, who personally witnessed the Sandy Hook tests, while satisfied that the dynamite guns as they are mounted on train and elevating carriages are all that the inventors claim, still he has been confirmed in his belief that they are not suitable for use on shipboard. The drawbacks to such use are the great weight of the guns and compressors and boilers, the valuable space occupied, the short range of the weapons, and the impossibility of aiming them without turning the whole ship. Besides the ordnance bureau has been meeting with a high measure of success in its efforts to develop the use of high explosive shells in ordinary rifled guns. It has already accomplished the projection of a six-inch shell charged with high explosive at a speed of 1,400 feet per second over a distance of four miles, and if the twelve-inch rifle performs as well with a 200-pound charge of dynamite it will, with its superior accuracy and long range, be much more efficient for ship use than any other form of gun.

SEEING A LONG DISTANCE.

It seems almost beyond the bounds of possibility that a person could see a distance of 276 miles from the summit of one mountain to another, yet the question appears to be settled, according to a discussion now going on in Oregon as to whether Mount Shasta in California can be seen from the summit of Mount Hood in the former state. One of a party which recently climbed Hood insists that he saw the other peak, with whose outline he is familiar. The actual distance between them is 276 miles. His statement was at first scouted, the computation being made by one mathematician that Shasta is seven miles below the horizon line of Mount Hood. Lieut. Taylor, of the United States Engineer Corps, being appealed to, consulted tables and official maps, with the following results: "Horizon line from Hood (11,200 feet high), 130 miles; horizon line from Shasta (14,440 feet high), 147 miles; total visible distance, 277 miles; actual distance between the peaks, 276 miles; distance to spare, one mile." From this it would seem that the projection of the horizon line from the summit of Hood would strike the top of Shasta were that mountain one mile further away than it actually is. For any one who is not enough of a mathematician to dispute, or understand, Lieut. Taylor's computations, the fact may be added as bearing upon the question whether one mountain is visible from the other, that since an ascent of Mount Hood, which a scientific party made a fortnight ago, there is reason to believe from observations taken by them that the mountain is considerably higher than the 11,200 feet of the last survey.

DANGER OF REVERSING THE SCREW WHEN GOING AT FULL SPEED.

Capt. John Bain, of Glasgow, a well-known Clyde nautical assessor, lately communicated a paper on this subject to the Institution of Engineers and Shipbuilders in Scotland. The opinions which he offered on the subject were, he said, obtained from personal experience in the handling of half a dozen large screw steamers, dating from 1873; and in corroboration of his conclusion he cited endeavors which were made in 1875 by Professor Osborne Reynolds, C.E., F.R.S., of Owens College, Manchester, and a committee of the British Association, to investigate the phenomena that had then been observed in the steering of screw steamers. In pointing out the danger attaching to the reversing of the screw while the vessel was going at full speed, he instanced several collision cases which had been heard in the Admiralty and other courts, where the reversion of the screw of one or both of the steamers colliding appeared to him to be the ultimate cause of the accidents, and which, he regretted, were not taken into consideration either by those who had charge of the vessels at the time of the collision or by the bar or bench to whom the facts of the case were presented in the course of the inquiry.

In addition to a number of other cases referred to, Capt. Bain quoted, as an illustration of the effect of putting the helm hard a-starboard and reversing full speed at the same moment, the collision between the Thistle, of Liverpool, and an unknown schooner; and, as an example of putting the helm hard a-port and reversing full speed, he adduced the case of the collision between the Thorsa, of Leith, and the Otto, of Hull, in the Baltic last year. Although there were dozens of collisions of a similar nature which he could mention, where the reversion of the screw just previous to the collision was perfectly plain, he contended that those two cases were about as clear and traceable to the effect named as any to be found on record. Stated briefly, Capt. Bain said that his contention was as follows:

That if the helm is put hard a-port on board a steamer having a right-handed propeller, and going full speed or nearly full speed ahead, and at the same moment the engines are stopped and reversed full speed, the vessel's head will cant to port instead of to starboard as, mechanically considered, it ought to do, or, in other words, that the vessel's head will in 15 or 20 seconds after the screw is reversed stop canting to starboard, and swing 15 or 20 degrees in the direction of the danger which it was intended to avoid. On the other hand, he held that if the helm is put hard a-starboard in such circumstances as those mentioned, the result will be that the moment the engines are "over the center" to go astern the vessel's head will swing to starboard, as if on a pivot, with amazing rapidity, and so increase rather than diminish the distance between her and danger.

SHIPMENTS OF SOUTHERN PINE TO LAKE SUPERIOR.

The competition of Southern pine with the lumber products of the lake region has been felt seriously in the Mississppi valley by Chicago lumber companies for some time, but never before has Southern pine been an article of shipment out of Chicago into the heart of the great lumber region of Lake Superior. The steamer J. D. Marshall loaded a few days ago 354,000 feet of Southern pine for Lake Linden. The lumber will go to the great Calumet & Hecla mine on Keweenaw Point, Lake Superior. This pitch pine is a Southern wood of much greater strength and life than any Northern pine.

NEWS AROUND THE LAKES.

CHICAGO, ILL.

Special Correspondence to The Marine Record.

The east shore steamers are bringing along large quantities of peaches from Michigan.

Capt. Julius Baker's schooner, York State, received a new stern before leaving port on Friday last.

The L. M. & L. S. Transportation Co.'s steamer Manitou, is doing a large business in carrying passengers between Chicago, Mackinaw city and Sault Ste. Marie.

J. G. Keith & Co., chartered the steamer Charlemagne Tower for corn to Buffalo at 1¼ cents, the schooner Wadena for clipped oats, South Chicago to Buffalo at 1 cent.

Capt. John Prindiville chartered the steamer C. H. Green for flax seed at 1½ cents, schooner Our Son corn at 1⅜ cents, and schooner Genoa wheat at 1⅜ cents, all for Buffalo.

The steamer J. D. Marshall has been chartered by P. H. Flemming & Co., for pine from Lake Linden to Chicago at $1.75 per thousand, the steamer Parker Foster for oats to Port Huron at one cent.

W. M. Egan chartered the steamer Robert Mills for 120,000 bushels of oats to Buffalo at 1⅛ cents.; steamer P. D. Armour for 125,000 bushels of oats to Buffalo at 1⅛ cents; steamer Kate Buttronia for 30,000 bushels of wheat to Milwaukee, pt.

List of steamers whose inspection certificates expire during the month of September in the Chicago district, are as follows: Joliet, September 4; E. E. Rice, September 6; A. S. Allen, September 11; International, September 14; Sunbeam, September 28.

The $1 daily excursions from Chicago to Milwaukee and return have become very popular. The Goodrich Co.'s steamer Virginia, and the whaleback steamer Christopher Columbus are carrying on an average between 2,000 and 3,000 passengers on week days and between 3,000 and 4,000 on Sundays.

At Miller Bro.'s shipyard the repairs on the steamer R. R. Rhodes, are being pushed forward. She will probably go out of dock Thursday night. The schooner A. Mosher was in dock for bottom calking, the steamer White and Friant to have a leak stopped and some repairs to her stern bearing, the schooner Parana for bottom calking and to have her center-board box and board taken out; the tugs A. A. Carpenter and J. G. Van Schaick for repairs to machinery.

A shipment of 350,000 feet of Georgia pine from Augusta, Ga., to Lake Linden near Houghton, in Northern Michigan, was forwarded from Chicago on the steamer J. D. Marshall, by P. H. Flemming & Co., vessel agents. The lumber goes to the Calumet and Hecla Mining Co., and is the first of a shipment of 2,000,000 feet of the same sort. The shipment is the first of the kind on record. As the destination is in the heart of the pine country it is very much in the nature of "carrying coals to Newcastle."

The schooners Truman Moss and George Sturges collided Monday night, about 8 o'clock, just outside the piers. The Moss was leaving port light, having been towed out just prior to the accident by the tug Ira Smith, The Moss was making sail, and in the thick smoke which pervaded the lake, did not sight the Sturges and Mary D. Ayer entering the harbor in tow of the tug Perfection, until too late to avoid the collision. The Moss had her jibboom, bobstays and some head gear carried away and one of her jibs torn. The damage to the Sturges was very slight. The Moss was towed back into port by the tug Ira Smith which had towed her out.

Capt. James S. Dunham, owner of the schooner James G. Blaine, received the following dispatch from North Port, Mich., from Capt. John Lundberg, Monday night: "Blaine on reef of North West Point, South Fox Island, one foot and half out, fore and aft, making water freely; got on three fifteen this morning in heavy smoke; have telegraphed tug Favorite, Cheboygan, for assistance. Answer and advise." Capt. Dunham telephoned at once to the Grummond Wrecking Co., Detroit, and their wrecking tug Swain left Tuesday morning for South Fox Island to endeavor to release the Blaine by the aid of hydraulic jacks. The James G. Blaine, light, was bound for Alpena for cedar. She is uninsured.

The thick weather from smoke over which Lake Michigan is enwrapped is likely to cause accidents and probably loss of life in and around Chicago harbor, yet the authorities at Washington do not do anything towards providing Chicago harbor life saving station with a crew of life savers. Why don't they send the two men who have charge of the station here to the Jackson Park station and send the full crew here where they are most needed.

WILLIAMS.

DETROIT, MICH.

Special Correspondence to The Marine Record.

It is no wonder the North West grounded at Bar Point when her passenger list is glanced at. This trip the big boat had the heaviest crowd of "big bugs" aboard that was ever carted over the lakes in one bottom.

Business in marine circles here, as at other ports, is beginning to brisk up, and vessels that have been laying in ordinary the greater part of the season are again moving, with a fair prospect of earning a little money before snow flies.

Work on the large car ferry steamer Transfer that was docked by the Detroit Dry Dock Co. has been completed and she is again afloat ready for business. The Canadian schooner Southampton is docked for calking. The Averill was also docked for a new propeller wheel.

The Detroit Boat Works is among the industries that keep things moving, no matter how dull other plants seem to be. Besides the steam yacht reported a few weeks ago, there are numerous orders booked for less pretentious craft, including sail yachts, life boats, yawls and a host of pleasure skiffs and row boats.

Passengers on a Canadian steamer libeled her here a few days ago in the sum of $3,500 for noncompliance with the terms mentioned when their passage was engaged. A lack of staterooms, whereby the ladies were obliged to sleep in cots and the rudeness, if not vulgarity of the ship's officers, are the grounds of the libel suit.

Capt. Alex Ruelle, who is one of the best known men at this port among vessel masters, says the season has been extremely dull, but he has managed to keep his small fleet moving at something nearly all the time. Many of his friends will be pleased to learn that Capt. Alex is still the same genial and hearty "bell puller" as of yore.

Work has been commenced at the Wyandotte yards of the Detroit Dry Dock Co. on a sidewheel steamer for A. Wehrle, of Sandusky. Her dimensions are to be 174 feet over all and 28 feet beam, of light draft, say, about 6 feet. As she is to be given good power, the name Arrow is thought to be an appropriate one for her, though her owner has yet quite a while to think it over.

One of the best conducted offices of the Weather Bureau on the chain of lakes is the handsome suite in the Hammond building here, presided over by Mr. Evans. Mr. Norman B. Conger, lake marine inspector of the service also makes his headquarters in these offices, and as the location is handy to the river he receives many personal visits from shipmasters engaged in taking observations for the Weather Bureau on the lakes.

The schooner American Giant, in tow of the tug Fern, of Algonac, passed down on Monday bound for Long point, Lake Erie, to take aboard the boiler and machinery of the sunken steamer Newburg, wrecked December 9, 1892, in a heavy southwest gale and snowstorm. The estimated value of the steamer and her cargo was placed at $90,000, but fortunately there was no loss of life.

About a year ago the Frontier Iron Works shipped the engines of the whaleback building at the Everett yards of the Pacific Steel Barge Co. and it was then expected that the vessel would at once be put in commission. Owing to a drop in freights and the general industrial depression which set in, work was stopped on the craft and but little has been done to her since. At the last annual meeting of the Steel Barge Co., held at Superior, Wis., it was determined to finish the whaleback under construction at that port as well as the one at Everett, and the Frontier Iron Works have accordingly received orders to send a superintendent to see that the fitting up of the engines is properly carried out at Everett, Wash.

Word reached here Wednesday of the stranding of the passenger steamer North West on Bar Point at 4 p. m. She missed the channel, which is very narrow for deep boats in entering Detroit river, by just 500 feet owing, it is now reported to one of her wheel chains carrying away. The smoke and fog which has prevailed over Lake Erie for a week was dense at the time the North West was trying to thread her way into the river, and although she was proceeding slowly she ran out two feet forward. Tugs were immediately dispatched to her assistance and as the general manager of the line is on board it is likely that she will be floated again in short order. No damage is anticipated as the soundings show a sandy bottom, but there is no telling yet whether she might not have rested on a small boulder imbedded in the sand.

BUFFALO, N. Y.

Special Correspondence to The Marine Record.

The damage to the whaleback steamer Pillsbury, which ran ashore recently on Topsail island, shows by the cost of repairs to be $8,000. About 20 shell plates had to be replaced.

Commissioner French of the Lake Managers Association is in the West, looking up the through freight situation. From Chicago he went to Milwaukeee and thence to Duluth and St. Paul.

The steamer Norwalk is in dry dock for a new fore foot. The damage occurred when she went ashore on North Harbor island reef, Lake Erie. About 11,000 bushels of wheat were jettisoned in the effort to get off. A survey was held on Wednesday on the steamer Northern Light. It was recommended that temporary repairs be made when a final survey for permanent repairs would take place at the close of the season.

The lake and rail line managers have not got together in the matter of through rates or if so there is a good deal of cut throat work going on and the trade is again becomming demoralized. It is a good deal like the fellow that enters into an agreement with the mental reservation that all others must conform to the terms of the compact excepting himself. There is an effort being made however to straighten out rates again, but, if as reported season contracts have been entered into at low rates it would seem a hopeless task to try to get the erring members back into line.

Bell's Steam Engine Works are again enjoying a season of briskness which this old established business is so well entitled to. A very skillful and prompt order has just been completed there this week. The passenger steamer Bon Voyage, sailing out of Charlotte, N. Y., broke her thrust shaft at the bearing and it was shipped to the Bell Engine Works, reaching there at 5 p. m. Friday and by Saturday night the shaft 15 feet long was forged and shipped to the steamer all complete with couplings on Tuesday. A specialty of the works are steam hammers, two of which are at present being turned out for Chicago parties and numerous other orders for shipment and local work are being filled.

The new revenue cutter or boarding boat Calumet is expected to be ready for her trial trip in about two weeks. It will be remembered that this is the craft contracted for by the Government with David Bell for $38,000. She is 90 feet in length and is supplied with a compound engine, diameter of cylinders 18½ high pressure, 32 low pressure and 26 inch stroke. She has an independent air and circulating pump and Wheeler surface condenser, also an independent feed and fire pump. The Ward type of boiler, with four furnaces, is expected to show 400 horse power at a speed of 12 knots an hour. The work of construction has been superintended by First Lieut. John Dennett, U. S. R. S., and Chief Engineer D. C. Chester, U. S. R. S. The trial test will be made by the superintendent of construction and engineer in chief of the United States revenue service.

CLEVELAND, O.

Special Correspondence to The Marine Record.

The L. R. Doty docked in the Cleveland Dry Dock on Tuesday to receive a new propeller wheel.

The tug Charles Castle, sunk in the river on Sunday after collision with the Passadena, has been raised and taken to the shipyard for repairs.

The steel steamer Frontenac cleared on Saturday night after undergoing a thorough overhauling and repair at the yards of the Cleveland Ship Building Co.

The local inspectors of steam vessels cancelled the license of the mate of the Ketchum this week owing to his pleading guilty to purloining a sum of money from the master of the boat.

Mr. Parke, city editor of the Buffalo *Enquirer*, visited this port on Tuesday on a short business vacation. His Forest City friends were pleased to see him the picture of health, robust and agreeable as usual.

At a meeting this week of the owners of the new steel steamer I. W. Nicholas, Mr. H. D. Coffinberry was elected president of the company, I. W. Nicholas vice-president, and Mr. Philip J. Minch secretary, treasurer and general manager.

The new steamer I. W. Nicholas, Capt. Wm. Gerlach, will be ready to start on her maiden trip in about ten days. It is somewhat remarkable that during the four months this large steel steamer was under construction the work was not delayed an hour owing to rain, although her keel was laid early in April.

The Cleveland Dry Dock Co. have mortgaged with the Guardian Trust Co. their real estate for $100,000 to cover extensive improvements made and contemplated on the present plant. A large amount of this sum is likely to be taken up by the stockholders of the Dry Dock Company.

At a special meeting of the finance committee of the Lake Carriers' Association, held in the offices of the president, Capt. James Corrigan, on Wednesday, an invitation to attend the Toronto deep waterways convention on September 17 was referred to the legislative committee at Buffalo.

The smoky weather on Lake Erie during the week caused vessel masters great uneasiness, as off the land the denseness keeping low on the water was as bad as a thick fog. That there have been no serious casualties is an evidence of how carefully the majority of lake tonnage is navigated.

On Tuesday next, September 4, the Cleveland & Buffalo Line of passenger steamers begin a popular series of excursions to Niagara Falls and Toronto. The rates are made exceedingly low and it is expected that a large

number of passengers will avail themselves of this opportunity for a lake tour.

At last a new river custom house is being erected on the east pier to take the place of the old shanty on stilts that has done service and disgraced the port for so many years past. The plans for the new reporting house show a very modest looking wooden structure to be placed just below the site of the present crib.

Now that the steamer Northwest has demonstrated her ability in every respect work will be resumed at the yards of the Globe Iron Works Co., on her sister ship the North Land. Minor details will be changed in the second ship and the experience gained in running the Northwest during the season will be taken every advantage of.

Pilots at the "Soo" are blamed this week for making false reports about vessels being aground when nothing has even touched bottom. The reports, it is said, are sent out so that owners may instruct their masters to employ pilots rather than run any risk of stranding. Such an accusation has never been brought against the "Soo" pilots before, and it is unlikely that for a $15 pilotage fee they would make false assertions to hurt their best friends, the vessel masters.

Cleveland owners, as well as a large number at other ports, have this week taken a step in the right direction and got together on a fifty cent rate on coal to the head of the lakes. A little more of this commendable unanimity and vessel property may be handled so as to leave a moderate return on the investment, not like it has been recently, keeping the boats chartered at figures that actually prove an annual loss, although changing a new dollar for an old one during a couple of months of the season.

COLLINGWOOD, ONT.

Special Correspondence to The Marine Record.

At a meeting of the Great Northern Transit Co., held here a few days ago, it was decided to build a new steamer to cost in the neighborhood of $100,000, for the North Shore, Sault Ste Marie and Mackinac route. The company have not yet made any definite arrangements as to what kind of steamer they will build. The length of keel will be in the neighborhood of two hundred and twenty-five feet, and the beam thirty-four feet. The speed to be attained is set at nineteen miles per hour. At this time of writing, Mr. Chas. Carman, the manager of the company, is corresponding with marine architects among whom may be mentioned Mr. Frank B. Kirby of of the Detroit Dry Dock Co., and also with a Cleveland architect. As soon as the figures are settled on I will give them to THE RECORD. The steamer may be built in Collingwood.

THE ARMOR CONTRACT FIASCO.

Mr. Cummings, from the Committee on Naval Affairs, presented his report on the "Violation of Armor Contracts" to the House, August 23. The report sums up the evidence at length and reaches these conclusions:

"The evidence discloses the fact that the Government inspection was negligent and defective. None of the inspectors were, however, charged with dishonesty, nor is there any evidence tending to show that any of them were corrupt. Some were diligent and others negligent. There was, however, a disposition on the part of most of them to assume that the company itself was watching its superintendents and employees. Mr. Frick, chairman of the board of managers, in his testimony (p. 691) said that he always relied on the fact that the Government had inspectors there. He did not know what they were there for unless it was to see that the specifications of the contract were carried out. The inspectors were thus relying upon the company and the chairman of the company upon the inspectors. Neither party, however, had any right to rely in this matter upon the other. Each had his own independent duty to perform. The company was bound to fulfill the contract in every particular, and the inspectors were there to see that they so fulfilled it. The failure of either to perform his duty was no excuse for the other. The company cannot shelter themselves behind the Government inspectors. Moreover, the fraud has been traced home to their general superintendent, himself a stockholder in the company. Commodore Sampson, in his testimony (p. 882), alleges that if the Ordnance Bureau had sent officers to the work to act as spies upon the company they would have gone with very different instructions. They did not go there expecting to be deceived, and he thought it no excuse at all for the company to say that they were negligent in their duties. He says that they were slow to believe that frauds were being perpetrated, and not so quick to realize them as they perhaps ought to have been.

"Certain it is that the inspectors were there to know of their own knowledge that the specifications of the contract were being faithfully carried out; they were not to rely upon others, but to know of their own knowledge that everything was right. It was their sole duty to protect the government. It is in evidence that while the manufacture of the armor was going on, day and night, including Sundays, the inspectors were on duty only eight hours each day, excepting Sundays, when they were not there at all. Allowing the eight hours to have been spent in the works, they were there only two-sevenths of the time. Their inspection covered only forty-eight hours of the one hundred and sixty-eight hours of work each week. Much of the eight hours of inspection was devoted to office work. At times only one inspector was on duty, and most of the time but two. While the committee believe that to-day the inspection is thorough, it is of the opinion, in view of what has happened, that the force of inspectors should be increased.

"If the criminality of a wrongful act is to be measured by the deliberation with which it is committed, the magnitude of the evils likely to result from its perpetration, and the want of provocation with which it is done, the frauds which your committee have found are worthy to be called crimes. The servants of the Carnegie Steel Co. (whether with or without the knowledge of the company), to increase their gains, deliberately continued for many months to commit acts whose natural and probable consequence would be the sacrifice of the lives of our seamen in time of war, and with them, perhaps, the dearest interests of the nation.

"The company were hired to make the best possible armor plate and paid an enormous price for so doing. They were hired to make an armor that would stand the shots of an enemy and upon which the nation might rely in time of need. They were paid between $500 and $700 a ton and thousands of dollars a plate for so doing. Resting under these obligations the company or its servants have perpetrated manifold frauds, the natural tendency of which was to palm off upon the government an inferior armor, whose inferiority might perchance appear only in the shock of battle, and with incalculable damage to the country.

"No fine or mere money compensation is an adequate atonement for such wrongs. The commission of such frauds is a moral crime of the gravest character. Your committee do not consider it as within their province to draft a criminal statute, but they do feel under obligation to call the attention of the House to the importance of protecting in the future the interests of the Treasury, the lives of our seamen and the safety of the nation by appropriate legislation, denouncing as crimes all such acts of fraud and deception practed upon the government in connection with armor plate and other materials of war, and making such acts severely punishable in all persons who commit them or aid and abet their commission.

"Notwithstanding all the admissions made by the superintendents of the Carnegie company, they claim that all the plates paid for by the government are up to the specifications of the contracts. They allege that they not only made the best plate that could be made at that time, but that the plates will all surpass the minimum acceptance test required by the government without regard to the alleged false treatment, plugging of blowholes or manipulation of tensile tests.

"Paragraph 92 of the contract of February 28, 1893, states that the obligation is imposed upon the contractor to satisfy the inspector that everything had been done in strict accordance with the terms of the contract. It has been conclusively shown that the inspectors have been satisfied, and the armor plates passed by the most notorious frauds. The efforts of the company, and of its superintendents, Cline, Corey and Schwab, have been to satisfy your committee that the armor is up to the requirements of the contract, notwithstanding the false reports to inspectors, doctoring of specimens, plugging of plates, fraudulent retreating of test plates, and "jockeying" of the testing machine. The unblushing character of the frauds to which these men have been parties, and the disregard of truth and honesty which they have shown in testifying before your committee, render them unworthy of credence.

"And everything bears against their contention. It is not to be supposed that such manifold frauds were continued for so long a time without an important object to be gained. As to the individual plates, and the groups of plates passed in many cases by fraud, the fair conclusion is that without the frauds they would not have passed.

"Two questions remain, however: first, whether, notwithstanding the frauds and the failure to attain the high standard required by the contracts, the armor is not still good steel and fair armor; and, second, the extent to which the government has been damaged by the frauds and irregularities practiced upon it.

"The terms of the resolution under which your committee is acting require them to ascertain the amount of damages. It is impossible, however, for them to do this with their present powers. The only way to determine the actual condition and strength of the armor is by subjecting certain plates of the groups passed by fraud to ballistic tests. This your committee has no power to do. For the information of the House, in relation to the question of further continuing this investigation by making such ballistic tests, your committee have ascertained the whereabouts of 59 representative plates, alleged to have been falsely treated.

"Believing that a test of these plates should be made, your committee have selected the plates which, in their opinion, ought to be tested. They recommend that the money necessary for such a test be taken from any moneys heretofore appropriated for the increase of the navy under the head of armor and armament."

OCEAN DEPTHS AND WAVES.

In a recent address by the President of the Geographical Section of the British Association, Capt. W. J. L. Wharton, R.N., F.R.S., Hydrographer to the Admiralty, stated that curiously enough, the deepest soundings have been obtained very near the land. The greatest depth known is 110 miles outside the Kurile Islands, where there are 27,930 feet of water. The next deepest is 27,366 feet, about 70 miles north of Porto Rico. With a few other exceptions the known depth of the ocean does not exceed 24,090 feet.

Storm waves are apt to lose none of their imposing nature when described after the event. Varying heights have been recorded for what are styled maximum waves; some assert 40 feet to be the highest storm wave experienced, others go as far as 90 feet. Admiral Fitzroy measured waves 60 feet high, but 90 feet is simply appalling.

ITEMS FROM THE LOG BOOK.

The tugs John Owen and Frank W. recently arrived at Alpena with a raft which is reported as containing 7,000,000 feet.

George C. Lawrence, engineer of the Iron Chief, has been appointed to the same position on the new Davidson steamer Madagascar.

Ashland shipments for last week were: ore, 65,164 tons; lumber, 3,360,000 feet; for the season: ore, 1,059,322 tons, lumber, 59,766,000 feet.

Robert Bruce, who for many years was engineer of the steamer Roanoke, recently burned on Lake Superior, has been appointed chief engineer of the Flint & Pere Marquette line of steamers.

Murphy's method in searching for the foundered steamer Dean Richmond, on Lake Erie, is to give the ends of a hawser to two tugs, who drag it on the bottom of the lake, buoying the ground as it is swept.

The resignations of Hull Inspector Gooding and Boiler Inspector Kruger, of the Sault District, have been called for. Their successors are slated as Charles York of Marquette, and Richard Langford of Sault Ste. Marie.

The tug Claude has been fined $500 at Marquette, Mich., for running three days after her inspection papers had expired. Her owner, Capt. Dalton, had made application for the papers, and it is believed the fine will be remitted.

A sum is appropriated in the sundry civil bill for manning the Chicago harbor life-saving station, which was abandoned for the Jackson Park station during the World's Fair, and as the fall gales are near at hand the work cannot begin any too soon.

Shipmasters complain that the fog signal at the new light-house at Chicago was not blowing when the fog was thickest Sunday night and that several vessels narrowly escaped colliding with the breakwater on account of depending to a certain extent on hearing the fog signal.

Mr. John Dyble, sr., died at Sarnia, Ont., on Monday after only about a week's sickness. The deceased was a shipbuilder and contractor. He built the steamers Monarch and United Empire, of the North-west Transportation Co., of Sarnia. Mr. Dyble was 56 years old and left besides a widow eleven children.

One thousand dollars in currency were stolen from the cabin of Capt. Mack, of the V. H. Ketcham, on the last trip on Lake Erie. Part of the money was found on the steamer's arrival at Ashtabula, the act being committed by the first mate, who confessed and implicated the second mate in the theft. Both were arrested, the master himself giving bonds and paying the officers' way home.

The tower of the old harbor light at Chicago is being taken apart and loaded on the light-house tender Amaranth. It will be removed to Twin river Point, Wis., and erected there. The order of the light at that point will not be changed. The tower has 30 feet added to it, and will make the new light-house 100 feet in height. The old harbor light at the mouth of Chicago, river was established in 1859, and continued until changed to the new one at the southeast end of the breakwater last summer.

AN important editorial article in *Harper's Weekly* for August 18th treats of the history of the Sugar Trust. The information conveyed in this article was obtained from "inside sources," and many interesting features and surprising figures are for the first time brought to light. In the same number "Our Navy in Korea" is the title of a graphic and well-illustrated account of operations under Admiral Rodgers in 1871, when the Koreans were defeated with great loss, and the American success led to the opening of three treaty ports. The story is told by Capt. W. P. Schley, U. S. N., who was Adjutant-General of the United States forces.

IN execution of its pledge that the valuable Columbian relics now in the custody of the State Department shall be returned to the Vatican on a ship of war, the Navy Department has decided that the cruiser Machias shall perform the service. The Machias is at the New York navy yard, where she has been many months undergoing the constructive work of being cut in two and lengthened to correct instability. She is nearing completion and will go into commission September 15th under Commander Houston, and is expected to sail about October 1. She was chosen because she will be the first vessel available for the service, and as she is going to China by way of the Mediterranean and Suez canal, she will not be diverted from her course.

MRS. BLANCHE S. LEATHERS, wife of Capt. B. S. Leathers, owner of the steamer Natchez, plying between New Orleans and Vicksburg, was granted a master's license last week after undergoing a rigid examination. Mrs. Leathers has passed the greater part of her married life afloat, and, as her husband is often detained ashore, she concluded that by mastering pilotage she could relieve him of the expense of employing a substitute during his enforced stay on shore. There are only two women besides Mrs. Leathers holding master's certificates, but there are three other women who are holding government certificates on steam vessels, two of whom possess mates' papers and the other a pilot's certificate.

MARITIME LAW.

NORTHERN STEAMSHIP CO. v. BROWN et al.

Circuit Court of Appeals, Sixth Circuit. May 8, 1894.

1. COLLISION—APPLICATION OF RULES. As act March 3, 1885, by which the revised international rules for preventing collisions at sea were adopted for the navigation of United States vessels upon the high seas and coast waters, expressly excepted navigation on "harbors, lakes and inland waters," Rev. St. §4233 continued in force as to navigation on the Great Lakes.

2. SAME—STEAMERS MEETING IN FOG.—Under Rev. St. §4233, rule 21, requiring every steamer approaching another so as to involve risk of collision to slacken speed, or, if necessary, stop and reverse, and when in a fog to go at a moderate speed, a steam vessel, in a fog, approaching another, whose whistle bears a few points off either bow, should stop, and, if necessary, reverse, until the exact position and course of the other vessel can be ascertained, unless such circumstances present themselves at the time as would lead a reasonably prudent and skillful navigator to the confident belief that no risk of collision exists.

3. SAME—CONFUSION OF SIGNALS. Two steamers, the N. and the S., approaching each other on nearly opposite courses in a fog, when a mile or less apart, exchanged repeated double-blast signals; but the S., mistaking some of the signals of the N. for single blasts, without stopping to ascertain the N.'s exact position and course, herself gave a single blast, ported, and, running across the bows of the N., was sunk in collision with her. Held, that the S. was guilty of reckless navigation and gross negligence. 43 Fed. 807, affirmed.

4. SAME—FAILING TO STOP AND REVERSE—RATE OF SPEED. The whistle of the S., as first heard from the N., bore but a point on the starboard bow, and was placed by the master of the N. only half a mile away, and there was no widening of the bearing of the S.'s subsequent whistles. Held, that the N. was also in fault in failing to stop and reverse, especially after the cross signal of the S., and in keeping up a speed of eight to ten miles an hour, at which she could not have stopped in the distance at which, in the fog, she could have seen an approaching vessel, while she could steer at four miles an hour or less. 43 Fed. 807, affirmed.

5. SAME—EVIDENCE. The rules that the burden on the manifest wrongdoer is greater than merely to show by a preponderance of evidence that the other vessel was guilty of fault, and that a slight fault is no ground for dividing damages, do not apply where the faults of such other vessel are shown by the allegations and proofs on her part, and where, but for her faults, the collision would have been avoided.

6. SAME—APPEAL—INTEREST ON DAMAGES. The appellate court, when differing from the conclusions of the court below as to the grounds on which that court allowed interest on the damages awarded for collision, may modify the decree by excluding such interest. 44 Fed. 492, affirmed.

WESTERN TRANSIT CO. v. BENHAM.

Circuit Court of Appeals, Sixth Circuit. May 8, 1894.

1. COLLISION—TRIAL—NAUTICAL ASSESSORS. In a collision case there is no error in the district judge calling to his assistance a navigator of experience as nautical assessor.

2. SAME—BETWEEN STEAMERS—FOG. The steamer Fountain City collided with the tug Samson on a starlight night, when there was considerable fog on the water, so that neither vessel was visible from the deck of the other. The captain of the steamer testified that he first heard one blast of the tug's whistle, about one point on the port bow, and answered it, indicating that the vessels would pass port to port. Next he heard three blasts from the same point, indicating that the tug had a tow, and he answered with a single blast, and ported his helm to give her a wider berth. At this time the mate reported from the crosstrees that the tug was on the port beam. He then heard two blasts from the tug, and answered them, and starboarded his helm. Then the tug gave a single blast, which he answered, and stopped his engines; but in a moment the tug was discovered ahead, and the collision occurred. Held, that, as the position of the tug was doubtful—her whistle sounding ahead, and the steamer's mate reporting her abeam—the steamer was in fault for not reversing when the captain heard the double blast, indicating a change of the agreement to pass port to port.

3. SAME. The steamer Fountain City collided with the tug Samson in the night-time, when fog on the water made each invisible from the deck of the other. The tug's lookout on top of the pilot house discovered the steamer about one point on the starboard bow. The tug gave two blasts, which were answered by the steamer, and starboarded her helm a little. A second signal of two blasts was answered from the same quarter, but the tug's third signal was not answered, and, though her officers became uneasy at this, she kept on until the collision occurred. Held, that the tug was in fault for not stopping and reversing when her signal was not answered.

HITCH v. MERCHANTS & MINERS' TRANSPORTATION CO.
MERCHANTS & MINERS' TRANSPORTATION CO. v. HITCH.

Circuit Court of Appeals, Fourth Circuit. May 22, 1894.

1. COLLISION BETWEEN STEAMERS—LIGHTS—EVIDENCE. The steam barge Susie Hitch, while on her voyage up Chesapeake Bay, about 7 o'clock in the evening, was struck and sunk by the steamship Decatur H. Miller. When sighted by the Hitch the Miller was about five minutes away, on the starboard bow, showing her green light. The Hitch blew two blasts of her whistle, and starboarded her helm. Hearing no response, she blew two more blasts. The Miller then shut out her green, and showed her red light, blew one blast, and at once came into the Hitch; The Hitch's side lights were set at six o'clock; were burning brightly at half past six. Witnesses for the Miller testified that they saw no lights on the Hitch; but her mate testified in the circuit court that he saw them burning five minutes before the collision. In his testimony in the district court he did not fix the interval between the time he saw the lights and the collision within half an hour; but, in the protest made immediately after the accident, it was stated that he saw the lights five minutes before the collision. Held, that the Hitch was not in fault. Jackson, District Judge, dissenting.

2. SAME. The steamship Decatur H. Miller, bound down Chesapeake Bay about seven o'clock in the evening in October, struck and sunk the steam barge Susie Hitch. The Miller, when sighted by the Hitch, about five minutes before the collision, was in Craighill channel, headed southeast by east, her proper course. The Hitch was off her starboard bow, in shoal water. Witnesses on the Miller testified that they saw no lights on the Hitch, and heard no blasts from her whistle. When the collision occurred the vessels were in less than three fathoms of water, out of the channel, and the Miller was headed west, so that she would shortly have gone aground. Held, that the Miller was in fault. Fed. Rep., Vol. 62, No. 1.

INVESTIGATIONS ORDERED.

Investigation into the acts of the captains of several excursion steamers out of Chicago will be commenced by local steamboat inspectors. Supervising Inspector J. W. Westcott has ordered that the investigation into the collision of the steamer Puritan with the little ferry steamer Richmond at St. Joe be commenced at once. Suit has been instituted in the United States court at Grand Rapids by the owners of the Richmond to recover the value of their boat.

AMPLITUDES.

The following approximate amplitudes of the Sun's rising will be given each week in this column during the season of navigation: A second bearing of the Sun may be taken at sunset by reversing the bearings to read west instead of east, as, for example, E. by N. ½ N. for a sunrise bearing would read W. by N. ½ N. for a sunset, or E. 10° N. to W. 10° N.

LAKE ERIE AND S. END LAKE MICHIGAN LAT. 42° N.

Sunrise.	Bearing (degrees.)	Bearing (points.)
Sept. 2	E. 11° N.	E. by N.
Sept. 7	E. 8° N.	E. ¾ N.

LAKE ONTARIO, S. END HURON AND CENTER LAKE MICHIGAN LAT. 44° N.

Sunrise.	Bearing (degrees.)	Bearing (points.)
Sept. 2	E. 11° N.	E. by N.
Sept. 7	E. 8° N.	E. ¾ N.

N. END LAKES HURON AND MICHIGAN, LAT. 46° N.

Sunrise.	Bearing (degrees.)	Bearing (points.)
Sept. 2	E. 12° N.	E. by N.
Sept. 7	E. 9° N.	E. ¾ N.

LAKE SUPERIOR LAT. 48° N.

Sunrise.	Bearing (degrees.)	Bearing (points.)
Sept. 2	E. 12° N.	E. by N.
Sept. 7	E. 9° N.	E. ¾ N.

With a compass correct magnetic, the difference between the observed and true bearings will be the variation for the locality. If there is any deviation on the course the vessel is heading at the time of taking the bearing the result after the variation is applied will be the amount of deviation on that course.

THE RAM A FORMIDABLE CRAFT.

The legislators who have made naval subjects a matter of much study now concede that it was a mistake for the present session of Congress not to authorize at least one or two additional battle ships.

The hole stove in the steel sides of the "Chicago" by an ordinary merchant steamer has been the subject of an official report and considerable discussion in a technical sense. Commodore Melville, among others, claims that no war vessel, no matter how constructed for offensive naval service, can withstand a punching by even a wooden craft of any size. He remarked: "People not familiar with such subjects have an idea that a vessel of war can resist the contact of another floating body like an ordinary steamer. They set up a great amount of criticism when such things have happened. In action the chief object is to keep the enemy off if on the aggressive and do the ramming yourself if that is the object. The most formidable craft afloat is the ram, a vessel with powerful engines, capable of high speed, and a deck and hull capable of resisting the enemy's heaviest shot, with simply a tower, but no guns for offensive work. Such a vessel would destroy a fleet.

"Admiral Ammen was on the right tack when he designed his ram. This craft will soon be finished. We should build a large fleet of these craft so as to have one or more to co-operate with our shore batteries and ships in every seaport in the United States. As a means of aggressive coast defense they are more formidable than the heaviest battle ships. Engines like the 'Columbia' or 'Minneapolis' in such a craft would make her the terror of a whole hostile fleet."

COLONEL PARSONS ON THE IRON ORE INDUSTRY.

Colonel R. C. Parsons has returned to Cleveland after successfully representing the Lake Carriers' Association at Washington in their desire to maintain a tariff on iron ore. It seems even at this time to be beyond the question of a doubt that if the vesselmen had not been so ably represented, mine owners would have closed their mines and a major portion of the vessels, instead of earning fair freights, would now have been tied up and their crews discharged from further service this season.

As an indication of how the Hon. R. C. Parsons grasped the subject in which such vast northwestern interests are concerned, the following interview from the Washington correspondent of the Chicago *Record* amply proves:

"Cleveland was the pioneer city in the iron ore industry. More than forty years ago it began to mine the ores of Lake Superior, to buy large tracts of land and develop the copper and iron industries, which have now swollen to such enormous proportions that the capital employed in the iron ore industries on the Great Lakes is valued at above $200,000,000. Of this $10,000,000 is in docks and equipments on Lakes Superior and Michigan. Railroads used exclusively in transportation of ore from the mines to the shipping ports on Lakes Superior and Michigan cost $32,000,000. The capital invested in the Lake Superior district amounts to over $71,000,000; in docks and equipments on Lake Erie $12,000,000, and in railroads exclusively carrying ores from Lake Erie ports $26,000,000. Since the opening of the season of 1893 this vast mining property has paid few or no dividends. A large part of the mines have been closed the greater part of the time. The value of Lake Superior iron stocks has fallen in Cleveland since 1892. One favorite stock which sold for $50 per share in 1892 is selling this summer at $7."

"The vessel interests which I directly represent," said the Colonel, "have been most seriously affected. You know that our ores have to be carried nearly 1,200 miles by water to get them to market, a distance as great as that from New York to Cuba. In 1893 the actual loss on 800 vessels engaged in the carrying trade on the lakes averaged $2,000 each, or $1,600,000, due solely to the threatened disturbance of the tariff bill. Of the 16,000,000 tons of ore mined in this country in 1892, over 9,000,000 came from the upper lake regions. I think that over 2,500,000 tons of ore brought down the lakes last year, landed at an actual cost of about $3.50 per ton, were sold this year at from $2.50 to $2.75 a ton.

"One thing is absolutely certain: If a decent price is paid for labor or as dividends on capital employed, or any living rate paid for freight on the vessels, ore cannot be sold to-day in the open markets for what it costs to produce it. Take off all protection and Cuba and Spain can send ores to this country far cheaper than we can produce them. The foreign vessels engaged in the carrying of ores are of the poorest character, the crews are paid starvation wages, the ores are mined at almost the cost of slave labor and the distance they are carried counts but little extra in the total cost. In 1890 Spain mined over 6,000,000 tons of ore, but made less than 200,000 tons of pig iron. The cost of the labor of men and women at her mines varies from 25 to 60 cents a day. I understand about 1,000,000 tons were landed last year at Philadelphia and Baltimore, brought here over the ocean at the rate of 5 shillings a ton freight.

"It seems to me that if the tariff on iron ore ever is removed and the market of the United States is opened to all the world, there is every reason to believe that several millions of tons of foreign ores will find their way to this country. There are only about so many tons of ore used in the United States yearly, and, if a large part of this demand is supplied by the foreigners, a blow will be struck at our vessel interests on the lakes which may largely destroy their value. I cannot but see that from 4,000,000 to 6,000,000 tons of iron ore coming to this country must actually take the place of 4,000,000 or 6,000,000 tons mined here, and that means just so much capital and labor cut right out of the heart of American industries."

"What do you know about the mining of ores in the Mesaba range?" was asked of Col. Parsons.

"There is a great mistake in regard to the value of the cheap mining of these ores," he replied. "I understand the ores lie in a bed nearly thirty feet from the surface, which has first to be removed. Besides, only a portion of these ores can be used without combination with other ores, and the demand for them, as a matter of course, must necessarily be of a limited character. So far the competition of this ore and its production has given no uneasiness to the regular mines, and it is not believed from the character of the ores or the cost of mining that it can seriously interfere with the general mining in ores of the lakes."

THE plans for three torpedo boats are completed, and it is thought probable that proposals for their construction will be advertised by the Navy Department within a month.

THE NAVAL RESERVE OF THE UNITED STATES.

BY AARON VANDERBILT.

A service bearing the relation to the United States navy that the national guard does to the United States army has been established, adapted to the institutions of a republic, unlike any naval reserve service abroad. It is in touch with the people of the country and of the United States navy through two branches, a third to be established, viz., the naval militia of the States, established naturally where a state borders on a great waterway, already provided for by law; the ships of the merchant marine, now accomplished through the mail subvention act, and the navigating reserves, yet to be established, but to be composed of the sea going force of the country—officers and men of the merchant marine—the whole constituting the naval reserves of the United States. To round this work up, a bill providing for the latter branch of this service has been introduced in the House of Representatives by its champion, Hon. Amos J. Cummings (H. R. 5384), entitled, "A bill to provide for the enrollment and organization of naval reserve forces. This bill has grown out of a committee of the board of trade and transportation, of which I have the honor to be chairman, and which is composed of the well-known citizens, Wm. H. Webb, George W. Quintard, and Joseph J. O'Dônohue, the late Orlando B. Potter also having been one of the committee—all devoted to the cause, and well appreciating the importance to the country of thus completing an auxiliary fighting force for the sea and its tributaries.

The celebrated ocean greyhounds of the American line, the Paris and New York, while under the flag of Great Britain, were commanded, officered and partly manned by commissioned officers and enrolled men of the naval reserve of Great Britain, a high standard of rank and endorsement by the government, an additional guarantee to the traveling public of security for life and property at sea, and always at hand in the event of threatened hostilities to command or take part in the command of ships as cruisers in the service of the government, understanding, from a long service of management, the best qualities of their ship for naval manœuver.

Why should not these ships under our flag be officered and manned on the same high naval service as also the other high-powered steamships of the merchant marine bearing the flag of the United States?

The speedy ocean-going steam yachts should be a branch of the service. What vessels could be more efficient for the service than the Alva, Corsair, Valiant, Nourmahal, Namouna and Atalanta—models of naval architecture and engineering skill—as cruisers, dispatch or torpedo boats?

This work would be completed by the adoption of this or a similar bill. In the war of the rebellion some fifty thousand officers and men were in the United States naval service from the merchant marine—seven hundred ships from this service were added to the navy. They were the key to the situation in bringing to a close the war, blockading some three thousand miles of the enemy's coast, shutting off sustenance and supply from abroad, which would have perpetually given life and vitality to the foe in dividing the republic. Had the enemy possessed a trained naval reserve, they would have "stood off" more effectually the attack. They did not; hence the soldier encountered afloat was at as great a disadvantage as a lion would be if attacked by a sword fish at sea. The element is not a fair field for the land monarch.

The country should complete this most inexpensive naval service of the citizen sailor, and be prepared for hostilities that may menace us at any time—a naval war—and thus establish the United States naval reserve complete in all respects, and adapted to the institutions of our great republic.—*Burgee and Pennant.*

LAKE ERIE SHIP CANAL.

The project of a ship canal from Lake Erie to the Ohio river has had advocates for many years, both in and out of Congress, and opponents as well. The first practical step toward a solution of the engineering problem is taken in the river and harbor appropriation act of this year requiring the Secretary of War to appoint a board of army engineers to make a survey of the different routes proposed and report to the next session of Congress as to the practicability of the project and its cost. Three routes proposed are from Erie to Pittsburg; from Cleveland to Marietta, Ohio; and from Toledo to Cincinnati. There is already existing an all-waterway for canal boats over each of these routes. The cost of widening and deepening the channels and putting in locks so as to accommodate vessels of 280 tons burden is what is sought to ascertain.

While the floating of great vessels without unloading from lakes to gulf is a fascinating conception, the opponents of the expenditure urged that the vessels built so as to navigate the lakes would be helpless and useless after they were brought into the Ohio and Mississippi rivers, and vice versa with river craft in the lakes.

On the other hand, it is argued that an all-water route for the Michigan iron ores and the Pennsylvania and Ohio coal supply is the only thing that will enable the Western Pennsylvania and Ohio iron manufacturers to compete with the fast-developing industry in the South. Advocates of the project see prospects of an immense growth of water traffic if it is completed. Some authoritative settlement of these conflicting opinions is hoped for from the work of the commission to be appointed.

CHANGING THE PORT OF HAIL.

Word has been received from the head of the lakes that the officials of the American Steel Barge Co. have practically decided to make Superior the home port of the whaleback fleet. Though all of the vessels were built at Superior and the offices of the company are located there, the vessels now hail from Buffalo. The only reason that Superior was not made the home port of the line in the first place was the fact that there might be some complication respecting the taxation of the vessel property, but this reason no longer exists. The only whaleback vessel that hails from Superior is the passenger steamer Christopher Columbus, while there are thirty-four of these vessels afloat and one more under construction at present. It is decided also that all whaleback vessels that shall be built on the Pacific coast or elsewhere by the American Steel Barge Co. shall hail from Superior. Superior is already the home port of the Northern Steamship Line, including the passenger steamer North West, and will be also for the passenger steamers of this line which will be built in the future.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—OHIO.

BLACK RIVER PIERHEAD RANGE (REAR) LIGHT-STATION. Notice is hereby given that, on or about August 25, 1894, the three fixed lights, two red and one white, arranged vertically 4 feet apart, with the white light in the middle, will be shown from lens lanterns in the inclosed part of a square, pyramidal, skeleton wooden tower, located on the shore end of the west pier, and about 1,070 feet from the front light near the outer end of the pier, entrance to Black River Harbor, Lake Erie, Ohio.

The focal plane of the white light will be 61¼ feet above the mean level of the lake.

The timber foundation of the tower is red, the skeleton and inclosed part white, and the roof black.

The lights in connection with the light on the outer end of the west pier form a range for approaching the harbor.

By order of the Light-House Board.

JAMES A. GREER,
Rear-Admiral, U. S. Navy, Chairman.

Office of the Light-House Board, Washington, D. C., August 24, 1894.

There is now a dock at Algoma Park with twenty feet of water and every convenience for fueling. The owners state that vessels may tie up there at a merely nominal charge during thick weather, and to facilitate vessels desiring to use the dock a fog bell will be kept ringing, at other times a light will be shown from the dock. A large new hotel, ship supply store and telegraph communication are among the improvements now being carried out at Algoma Park.

A NAVAL PAY SCHEDULE.

The Secretary of the Navy has issued the following orders relative to the pay of enlisted men:

1. Each enlisted person in the navy, other than an apprentice shall, during his enlistment, be required to keep to his credit at least two months' pay of his rating in which he is serving.

2. Each apprentice shall, in like manner, be required to keep to his credit at least two months' pay of his rating.

3. Each person in the navy serving on board a seagoing ship, except apprentices on cruising training ships shall, with the approval of his commanding officer, be allowed to allot such portion of his pay for the support of his family or other relatives, or for his own savings, as he may desire, provided in the case of enlisted persons the amount of pay to their credit on the rolls of the pay officer shall not be reduced below that specified in paragraphs 1 and 2.

4. Enlisted persons in the navy shall be allowed to draw money monthly in accordance with their conduct classes, as follows:

First class conduct men—The amount due in excess of the amount to be retained on the rolls.

Second class conduct men—One-half of one month's pay, or so much thereof as may be due in excess of the amount to be retained on the rolls.

Third class conduct men—One-third of one month's pay, or so much thereof as may be due in excess of the amount to be retained on the rolls.

Fourth class conduct men—One-fourth of one month's pay or so much thereof as may be due in excess of the amount to be retained on the rolls.

MARINE AND RAILROAD ENGINEERS.

SEATTLE, WASH., Aug. 22, 1894.

To the Editor of The Marine Record:

I was much surprised at your publication, under "Items from the Logbook" (issue of July 5), regarding the reported action of the local Association of Marine Engineers at Chicago affiliating with the striking railroad employes, and especially that such action received the support of Bro. T. F. Dowd, national secretary M. E. B. A. I did, however, blame you, but would like to know the name of the individual who originally filled the associated press reporter, as I consider the circulation of such reports, also Jas. A. McCauley's comments on Gen. Dumont's construction of the law (in the correspondence column of THE RECORD, issue of August 16) detrimental to the rank and file of all intelligent American marine engineers, such as compose the M. E. B. A. Under our constitution etc., we cannot participate in a strike of any description and our difficulties must be settled by arbitration or remain unsettled. Bro. Dowd's reported sanction is strictly opposite to his circular letter (which I do not feel at liberty to publish) and from my personal acquaintance with him I do not believe him capable of duplicity. Geo. Uhler, our national president, also expressed his opinion of this matter very plainly to the public through the columns of the Philadelphia *Ledger* and both were actuated by these same laws which Gen. Dumont quotes in the article headed "Marine and Railroad Engineers" (THE RECORD of July 19).

Gen. Dumont is right in his conclusions and expressions and we as sworn have no right to refuse to serve at any time we may be requested. It is true shipowners would probably never resort to the extreme, but the fact still remains that it would not require the force of arms to settle a strike of licensed steam vessel employes. We would first be asked to serve or give written reasons, which reasons could be passed upon by any U. S. judge (if they passed the inspection service) to determine if they were tenable or not and if decided adversely our only resource would be to comply or submit to punishment. After such action (supposing it to include all licensed men) the ships would be free to sail without licensed men (Sec. 4463 R. S.) for it would then be without the consent, fault or collusion of the master, owner or any person interested in the vessel." If this state of affairs should ever happen probably the U. S. court would set the wages for such compulsory service, as in other emergency cases, as "the highest rate paid out of the port," but do not for a moment think that these laws (Sec. 4,445, 4,449 and 4,463, R. S.) are not binding. The history of the case of the steamers City of New York and Paris should teach us a lesson on the application of a law.

Gen. Dumont knows what he is talking about and is backed by public opinion, more than that, he is an engineer's friend and when we succeed in getting the inspection service under the civil service rules, with lawmakers in Congress who show a disposition to do what they are sent there for, we can reasonably expect to see Gen. Dumont's suggestions to Congress carried out and then we will have this incomplete branch of the federal government in shape to be of some value to the mariner. Until then it is foolish to set up private opinions against official opinions or to construe the laws to our own satisfaction, as such action can only be detrimental to order and the individual. FRANK H. NEWHALL,

Secretary M. E. B. A. No. 38, Seattle, Wash.

THE London *Shipping Gazette* recently remarked, in referring to the bills presented to Congress by the American Seamen's Union, that the tendency of that body, both in its American organization and in Great Britain, seems to be toward a system of co-operative manning of ships, in which there shall be no captain or officers, but the one-man-one-vote principal shall prevail, and it will not be surprising if their next demand will be for money from the Government at a low rate of interest with which to build co-operative vessels. But, as our contemporary reflects, "one such vessel would be enough to start with, for we should soon know whether the tyranny of the ordinary ship owner or that of the co-operative seaman-ship-owner was the more marked." Happily," says the New York *Marine Journal*, "the Sailors' Union bills introduced in Congress appear to have been overcome by the hot weather and died in infancy, instead of being nursed through committees and permitted to develop into abnormal freaks of legislation."

THE MARINE RECORD

ESTABLISHED 1878.

PUBLISHED EVERY THURSDAY, AT 144 SUPERIOR ST., (LEADER BUILDING), CLEVELAND, O.

IRVING B. SMITH, CAPT. JOHN SWAINSON, } . . . PROPRIETORS

BRANCH OFFICE:

CHICAGO, ILL., ... 179 LaSalle Ave.

THOMAS WILLIAMS, Associate Editor.

SUBSCRIPTION.

One copy, one year, postage paid, . . . $2 00
One copy, one year, to foreign countries, . . $3 00
Invariably in advance.

ADVERTISING.

Rates given on application.

Entered at Cleveland Post Office as Second-class Mail Matter.

CLEVELAND, O., AUG. 30, 1894.

THE Maxim air ship is creating a wide-spread interest although it is not an unqualified success by any means. Floating through the air impelled by mechanical means is certain of being accomplished, but how or when is decidedly hard to prognosticate. Aerial navigation has long been talked of and the modern Atlantic "greyhound" may yet be reported by one of these winged messengers a couple of days in advance of her arrival at port. Perhaps such an object would be more useful in military or naval warfare than in commercial pursuits, or again they may become common enough for the tourist to take a spin through the air when desiring to change locations.

THE evidence disclosed at the recent investigations into the armor plate made by the Carnegie Co. for the new navy reveals negligence of the grossest sort on the part of the officers of the Ordnance Bureau detailed to inspect the work of the company turning out the plates, and a still worse state of affairs among the Carnegie superintendents who willingly and knowingly perpetrrated upon the government such fraudulent work. The report of the Congressional Committee contained in this issue is couched in very strong terms and their entire proceedings has been published in the Congressional Record so that it is very evident no desire has been evidenced to cloak or shield the imperfections of either the government inspectors, whose duty it was to see that the Navy was provided with what it had contracted for, or the manufacturers of the plate, who were expected to live strictly up to the letter of the specifications. As the committee reported, no fine or mere money compensation is adequate to meet the gross frauds, yet it is within the province and becomes the direct duty of the government to draft a criminal statute which will in the future prevent a repetition of such glaring wrongs, thereby protecting the lives of our seamen and saving a loss to the nation of expensive war ships.

THE recent report on the state and local taxation of vessel property compiled by Mr. Eugene T. Chamberlain, U. S. Commissioner of Navigation, and published in THE RECORD at the time, showed some of the most glaring inconsistencies in the matter of taxation that have been brought to light before the maritime world. From the figures presented by the commissioner, discrimination not only exists among our own states, but any oversea trade which we might enjoy would be taxed in a much greater degree than the shipping of other countries. It is true that the result of the comparison of taxes levied on floating property owned in the United States and that owned in foreign countries has called forth widespread attention and comment. It is equally pertinent to remark that the discrimination found to exist between adjoining states has also been taken into consideration, yet there seems to be no way out of the dilemma unless through a change of the port of hail to a state where this inequitable taxation is remitted, and such a course will no doubt prevail in the near future if state legislalatures will not act in the matter. Hitherto taxes have been paid out without much if any demurring on account of vessels being able to make fair returns on the capital invested, but, in the light of the past season especially, owners will no doubt think twice before adding to their already significant column of losses by paying out sums of money in return for which not the slightest service is given by the state, hence, we would not be surprised to see quite a fleet of steamers changing their ports of hail at the close of navigation, and it is only after such steps have been taken that the burdensome tax levy now exacted at certain ports will be rescinded. It seems unnecessary to state that the traveling expenses to a port where an annual meeting could be held would form but a small item of expense compared to the amounts now exacted as vessel property tax.

SUBMARINE CRAFT.

Now that a naval committee are again engaged in endeavoring to learn the merits of the several submarine boats invented, we are pleased to say, by Western talent, the Raddatz craft ought to be given due attention.

The inventer of this apparently successful vessel is Mr. Raddatz, of Oshkosh, Wis., and last week an exhaustive private test in thirty feet of water proved the submarine craft to be all that her inventor has hitherto claimed. The hull is tested to withstand the pressure of water at a depth of five hundred feet, and her surplus lifting power is sufficient to bring her to the surface from a depth of 610 feet. Up to the present the air machines with which the boat is fitted, have worked continuously for twenty-four hours, and she has been submerged for as long a period as three and a half hours.

The interior of the vessel is lighted by means of Edison low potential incandescent lamps of small size, giving little heat and consuming no air while burning. Electricity for operating the lamps as well as most of the other electrical appliances on board is furnished by primary and storage batteries which are placed in a separate room forward of the conning tower and directly under this latter are placed the various gauges, valves, levers, indicators, etc., to control not only the electric current, but also the action of machines in different parts of the ship. In this conning tower are placed the eight windows commanding every point of the compass and enabling the steersman to readily see surrounding objects and to shape a course while the vessel is submerged. From the above showing the Construction Board of Bureau Chiefs, appointed by the Secretary of the Navy, before deciding on any other type should at least look into the Raddatz boat, as, if she cannot be adopted in her entirety, there may be special points which it would be well to have in the equipment of the design already favorably reported on and known as the Holland invention.

About one year ago Congress provided the necessary authority and funds and nine plans with bids were sent in from various inventers, among them being two from George C. Baker, of Chicago. Mr. Baker built a vessel of this type at the yards of the Detroit Boat Works, and she stood good tests in Detroit river, but naval officers reported against its practicability. Eventually the board found the Holland design most nearly met the requirements and recommended its acceptance. The Secretary of War has now reached the conclusion to definitely determine the value of this type of vessel by actual experiment and favors the construction of one under the appropriation in order if approved as valuable to be used for coast and harbor defense.

The Holland type is the design which the board is now considering. It is first a submarine boat wanting in nothing that can be useful in such a vessel. It can run for six hours completely submerged at eight knots per hour. Its speed and endurance while on the surface of the water are sixteen knots continued for eighteen hours full power run. While the hull of the vessel is in the awash condition, it is a protected submergible torpedo boat, because its hull is covered by a depth of three feet of water, which is ample protection against projectiles. The top of the pilot's sighting turret, the only visible feature, is of Harveyized nickel steel eight inches thick and therefore strong enough to withstand the attack of rapid-firearms without serious injury. As a surface torpedo boat it has the great advantage of exposing practically no visible bulk out of water, and of having what is visible fully protected. It also has a heavier torpedo armament than any vessel of its size. Its usefulness in either one of these capacities is in no way affected or interfered with by its effectiveness in the other.

The objection to submerged boats which has hereto fore been urged as insuperable is the difficulty in steering, as it is impossible to see for any considerable distance under water. The new boat has provisions for surmounting this obstacle, being fitted with two independent sets of apparatus for securing exact steering while beneath the surface. Though if the reports of the tests are thoroughly reliable the Raddatz boat may also be steered with accuracy when submerged.

THAT WELLMAN EXPEDITION.

The failure of Walter Wellman to accomplish any practical results in his recent polar expedition has called forth derogatory remarks from all quarters.

It is not to be wondered at, however, that the Wellman expedition turned out as it has when we consider that a newspaper man under ordinary circumstances could not have gained the knowledge necessary to successfully guide an Arctic expedition. On the other hand, many will point to the splendid achievements of the African explorer Stanley and hold that the same success might have attended the Wellman expedition. Such a view of the matter is not in accordance with past experiences, and the man or party that reaches the geographical pole will have accomplished a vast deal more in adding to our knowledge of the earth we live on than it was possible for the explorers of Africa to have done, although not one word lessening the great work of the inland explorers, and the commendable zeal with which they carried out their work is justifiable from any standpoint.

The Wellman Arctic expedition was well found, everything that money could purchase or science suggest was placed at his disposal, but the main element was lacking, and that was adequate experience on the part of the leader to meet the exigencies of the adventure on which he had embarked. This essential of success is brought more prominently in the foreground when on a floating expedition, even though in comparatively clear waters, than it is under almost any other circumstances. How much more is it necessary when backing and filling among heavy ice to have this knowledge of knowing what to do at the right time and to always have a last resource and resort, the leader of the Wellman expedition may now realize. The upshot of the failure will have taught us at least one lesson, or rather more forcibly impress on the general public the old truism "not to monkey with the buzz saw."

Geographical explorations and surveys are distinctly a national work, and the knowledge desired to be obtained relative to the Arctic regions may best be secured by fitting out thoroughly equipped naval expeditions holding conjointly the successful result of their work as being of paramount importance to each of their respective governments and the world at large. As for the puny efforts of the many irresponsible Arctic cruises, which have lately become a fad among a certain clique of men, chiefly for scientific and even newspaper notoriety, no condemnation seems to be too great, and they well earn all of the physical discomforts and hardships which generally fall to their lot before they realize that the grit of a Columbus is not given to every ordinary mortal.

RELATIVE to our new navy, it has frequently been pointed out that without coaling stations the large, costly commerce destroyers can not long remain at sea, and will therefore be obliged to keep near to a home port in the event of a war breaking out. This is necessary so that they may have a base of supplies, yet, how galling it would be to a commander of one of these cruisers to be obliged to give up a chase when almost within range so that he would be enabled to fetch port again under his own steam. The cruiser Columbia, on her recent trip from New York to Bluefields, burned nearly 700 tons of coal when steaming at three-eighths boiler power for three days, and one-fourth for the remainder of the time, or nearly four days. To get the highest destructive power out of these vessels the nation employing them must have colonies in whose fortified ports they can replenish their bunkers in safety before starting out on another cruise. Such colonies the United States has not, and therefore many naval officers may be excused for viewing the commerce destroyer idea as a good deal of a delusion.

LAKE FREIGHTS.

Ore freights from the head of Lake Superior are firm at 80 cents, Marquette 65 cents and Escanaba 45 cents with a demand to better the last quotation by 5 cents.

Coal to the head of the lakes now commands 50 cents from Ohio ports, the 10 cent raise having been brought about through the firmness of vessel owners in agreeing not to carry up cargoes at a losing rate. Racine 60 cents, Milwaukee 55 cents, Manitowoc 50 cents, Escanaba 40 cents, St. Ignace 35 cents. Buffalo to Lake Michigan ports 50 cents, Bay City 35 cents, Windsor 25 cents. Oswego to Milwaukee 85 cents, Toledo 50 cents.

The Duluth rate on wheat is at 2½ cents. Chicago 1⅜ cents with an effort to secure 1½ cents and a report that such had been paid in one case; oats 1⅛ cents; wheat from Chicago to Milwaukee ⅞ cents, Detroit wheat to Buffalo 1¼ cents.

NOW AN AMERICAN CITIZEN.

Capt. Watkins, late of the Inman or International Line, is to return to the command of the steamer Paris. When the City of Paris was placed under the American flag it became necessary to relieve Capt. Watkins of his command because he was not an American citizen. He was transferred to the Berlin, but has now become a citizen and will assume command of the Paris on Saturday next.

It will be remembered that the engineers were retained when the boats changed their flags as they were ruled upon as not being ships officers, and now in a dog-watch hence, the commanding officer who was then pronounced ineligible to take charge of an American ship on account of his being a foreigner, is found to be a full fledged citizen with all power to act in the capacity of a United States licensed officer.

There is just one question to ask in this connection and that is, are there no Americans in the merchant service capable of ferrying boats across the Atlantic? If not, then there is every excuse for naturalizing foreigners especially for the duty, but it is an awful rap at American seamen.

AMERICA'S NEW OCEAN STEAMERS.

The St. Louis and the St. Paul, the two new American steamers, are rapidly approaching completion at the Cramp works, Philadelphia. They are the first trans-Atlantic passenger steamers to be built in the United States for over twenty years and are the largest vessels ever constructed in America. Their principal dimensions are as follows: Length over all, 554; length on water line, 536 feet; extreme breath, 63 feet; moulded depth, 42 feet; tonnage, gross register, 11,000 tons. Arrangements have been made for carrying in each vessel about 320 first class and 200 second class passengers and 900 emigrants.

The engines will be the most powerful quadruple expansion marine engines in the world. They are expected to develop about 10,000 I. H. P. each. The cylinders will be 36, 50, 71 and 100 inches in diameter respectively with a piston stroke of 60 inches. Two sets of engines will be placed in each boat to turn the twin screws, which will be sectional with three blades. Steam will be furnished at about 200 pounds pressure by six double ended boilers, each 20 feet long and 15 feet 7½ inches diameter. The total grate surface will aggregate about 830 square feet, and the heating surface about 30,000 square feet. To conform to contract the vessels must show a speed of 20 knots per hour at sea.

These vessels are being constructed in conformity to special laws enacted by Congress in 1892. Authority was given the International Navigation Co. of Philadelphia to place under under the American flag two of its fast English built vessels, provided others of equal or higher class should be promptly built in this country.

This is the first time an effort has been made to use quadruple expansion in engines of over 4,000 I. H. P., and in only one or two instances has it been applied to engines of that power. In speaking of the vessels, Charles H. Cramp, in a paper read before the American Society of Naval Architects and Marine Engineers, said: "I will not venture prediction as to their probable performance, but I will guarantee them to be perfectly safe, comfortable and economical ships. They are to be closely followed by other ships, which I will not now describe, except to say they will not shrink from comparison or competition. The St. Louis and St. Paul have been especially arranged so as to be readily and quickly convertible into armed cruisers, carrying eight 8 inch 100 pound rapid-firing guns, and the conditions of the mail contract between the United States government and the International Navigation Co. place at the disposal of the American navy these great ships, almost instantly convertible into commerce destroyers, averaging greater performance than the Columbia, which, with the three others that are about to follow as quickly as the plans can be completed, will practically re-enforce the United States navy by $21,000,000 worth of ships, and that not only without cost of building, but also without the expense of maintenance and commission in time of peace. In conclusion, allow me to say that these ships will be American from truck to keelson. No foreign materials enter into their construction. They are of American model and design, of American material, and are being built by American skill and muscle."

THE WEEKS' CASUALTIES.

Quite a number of strandings have occurred through the smoke hanging over the lakes during the past few days. Among the list of casualties are the steamer Florida, Pyramid Point, Manitou island; schooner James G. Blaine, South Fox island; steamer M. T. Green, Mackinac island; schooner C. H. Burton, Mackinac City; steamer Norwalk, North Bass island, Lake Erie; steamer Emily P. Weed and E. B. Hale, St Mary's river. Steamer Germania and consorts Wyandotte, Case and Sprague at Grindstone City. The passenger steamer North West grounded at Bar Point, tug Valerie with passengers Gratiot River near Calumet, Lake Superior.

DANGERS OF MECHANICAL FLIGHT.

Mr. Hiram S. Maxim, of flying ship fame, says that he is not trying to make a flying machine for either freight or passengers, but simply for war purposes. He then continues: "I am quite free to admit that the navigation of the air is beset with a great many dangers; it is also very dangerous to make high explosives or fire large guns, but it is infinitely more dangerous to be within range of an enemy's guns. What I propose to do is to enable one to assail an enemy from a distance greater than the enemy will be able to strike back with the most powerful gun in existence. So I think it would be quite as safe for combatants to employ my means of assault as to employ the present means, which necessitate their approaching nearer to the enemy and having to receive its fire. I do not know that any one has ever invented a system of warfare which is perfectly safe. It is known now to be possible to make a machine that will actually fly at very high velocity; so nothing remains to be done except to learn to manoeuver it. In view of the decided advantage which a flying machine would give its possessor over an enemy, I do not think that in case of war European nations would hesitate to employ them, even if one-half the men navigating them were killed. At the present time no difficulty is ever found in getting volunteers to make a torpedo boat attack upon a man-of-war, something which is infinitely more difficult than navigating a flying machine would be, as the latter might be painted black and make its attack at night or in a fog, when it would be quite impossible for the enemy to strike back. War, at best, is a dangerous game, and those entering upon it are playing with dangerous instruments, whether they are guns, dynamite or flying machines."

REPORT AT THE STRAITS.

A request has been sent out asking that masters will use their best efforts to report at Mackinac, as owing to the dense smoke and foggy weather prevailing over the several lakes, great anxiety is experienced not only by owners, but by the relatives and friends of the crews.

STAGE OF WATER AT ST. MARY'S FALLS CANAL.

DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

Depth of water at the St. Mary's Falls Canal for the week ending Aug. 30, 1894:

Aug	23	8 a. m.,	14	feet	10	inches.	8 p. m.,	15	feet	.. inches.
"	24	"	15	"	..	"	"	14	"	11 "
"	25	"	14	"	11	"	"	14	"	10 "
"	26	"	14	"	11	"	"	14	"	11 "
"	27	"	15	"	2	"	"	14	"	10 "
"	28	"	14	"	11	"	"	14	"	10 "
"	29	"	14	"	11	"	"	14	"	9 "
"	30	"	14	"	9	"	"			

VISIBLE GRAIN SUPPLY.

The stocks of grain in Chicago elevators last Saturday evening were 24,330,000 bushels of wheat, 1,219,000 bushels of corn, 899,000 bushels of oats, 148,000 bushels of rye, and 11,000 bushels of barley. Total, 26,607,000 bushels of all kinds of grain, against 20,499,000 bushels a year ago. For the same date the Secretary of the Chicago Board of Trade states the visible supply of grain in the United States and Canada as 64,771,000 bushels of wheat, 3,037,000 bushels of corn, 6,098,000 bushels of oats, 290,000 bushels of rye, and 263,000 bushels of barley. These figures are larger than the corresponding ones a week ago by 870,000 in wheat and 1,000 in corn. The visible supply of wheat for the corresponding week a year decreased 572,000 bushels.

LAKE SUPERIOR CURRENTS.

Professor Mark W. Harrington, chief of the Weather Bureau, after a trip along the northwest shore of Lake Superior, undertaken with the purpose of a survey in order to complete the Weather Bureau map showing the currents of the Great Lakes, has again taken up his work at Washington. The professer was accompanied by Mr. N. B. Conger, the inspector of the lake marine work, with headquarters at Detroit. Owing to the character of the northwest coast of Lake Superior and the shores of the Isle Royale, which are very rocky and steep, showing the occurrence of a very heavy surf, it is impossible for the current bottles used in the determination of the lake currents to be landed without breakage.

In fact only one current bottle has been recovered from these shores and that in a deep inlet on Isle Royale, which the seas did not reach. In the absence of information to be obtained in the usual way, Prof. Harrington was forced to rely upon other methods, such as the indications of dry wood, the drift of wreckage and the accounts of fishermen, also direct observations of the drift of floating objects, etc.

Prof. Harrington reports to the Secretary of Agriculture, that from the information he has obtained, he has made it possible to complete the scheme of surface currents for Lake Superior, as shown on the map which accompanies the report. Many temperature observations were taken during the trip, observations which showed some interesting facts. It was found, for instance, that the temperature of the water in Lake Superior is very low, and especially in the open lake, falling sometimes in July and August below forty degrees.

AN OVERDUE.

Fears are entertained for the safety of the small schooner Restless, which sailed from Manitowoc for Pine Lake, Mich., seventeen days ago. The crew hailed from Manitowoc, Mich., and were: Capt. Herbert Benson, Roland Roeber and David Devine. The Restless is owned by Capt. Joseph Edwards. He has given up all hopes of ever hearing from either vessel or crew again. It is supposed that the schooner was run down by some steamer in the smoke which has hung over the lake, or that she was capsized in a squall. The Restless was built in Holland in 1867.

ST. PAUL AND THE DEEP WATERWAY CANAL.

Relative to a canal to the coast the St. Paul *Dispatch* says:

"There should be no two opinions as to the desirability of St. Paul being well represented at the deep waterways convention to be held at Toronto next month, especially in view of the fact that there is now a very fair probability that Lake Superior and the Mississippi will ultimately be connected by canal. In this age of progress and development there is no limit to the possibilities lying before an enterprising and determined people, and though there may be some who are inclined to smile at the idea of direct water communication between St. Paul and the seaboard via. the Great Lakes, it should be remembered that the project is no more chimerical than many of the achievements of the present day seemed to be a few years ago. It is, of course, impossible to predict what may be the outcome of the convention, but as to the advantages to the Northwest, which could accrue from the construction of the proposed channel there can be no question. Chicago, it is true, may not look with favor on the scheme, as the natural result of its consummation would be to divert a considerable proportion of the traffic that is now handled in that city, but the interests of one locality cannot stand in the way of benefits to the people at large Could an exact statement of the freight charges on imports and exports of northwestern goods be obtained, the magnitude of the figures would cause the eyes of many to open in astonishment, and this deep waterway plan, by which very material reductions would be made in the cost of transportation, would be hailed with enthusiasm. To the farmers it would mean a better price for their produce, and to the consumers throughout the Northwest lower prices on commodities brought in from the East. It is after all not unreasonable to expect that ocean vessels may yet be seen in St. Paul, although until the survey of the proposed canal is completed predictions on that score cannot very confidently be made. Still, there is the possibility, and so long as we have that before us we should lose no opportunity afforded us of promoting and encouraging a project that may in the end be of very direct advantage to us."

WEIGHTS OF METALS.

According to the *Railway Review* cast iron weighs 444 pounds to the cubic foot, and a one-tenth square bar will sustain a weight of 16,500 pounds; bronze, weight 525 pounds, tenacity 36,000; wrought iron, weight 480, tenacity 50,000; hard "struck" steel, weight 490, tenacity 78,000; aluminum, weight 168, tenacity 26,000. We are accustomed to think of metals as being stronger than wood, and so they are, generally speaking, if only pieces of the same size are tested. When equal weights of the two materials are compared, it is then found that several varieties of wood are stronger than ordinary steel. A bar of pine just as heavy as a bar of steel an inch square will hold up 125,000 pounds; the best ash, 175,000 pounds, and some hemlock 200,000 pounds. Wood is bulky. It occupies ten or twelve times the space of steel. The best castings made for the United States navy have a tenacity of 65,000 to 75,000 pounds to the square inch. By solidifying such castings under great pressure, a tensile strength of 80,000 to 150,000 pounds may be obtained.

THE WEEKS SHIPMENTS FROM CHICAGO.

East bound rail shipments from Chicago for last week amounted to 47,161 tons against 45,589 for the preceding week, and 44,000 tons for the corresponding week of last year. The rail roads carried tonnage as follows: Michigan Central, 6,411; Wabash, 3,862; Lake Shore, 3,855; Fort Wayne, 4,702; Pan Handle, 5,994; Baltimore & Ohio, 2,870; Grand Trunk, 4,746; Nickel Plate, 5,627; Erie, 7,141; Big Four, 1,953; total, 47,161.

Shipments were made up of the following articles in tons; Flour, 2,318; grain and mill stuffs, 12,429; provisions, lard, etc., 10,087; dressed beef, 10,994; flaxseed, 1,158; butter, 1,323; hides, 1,937; wool, 1,378; lumber, 4,895; miscellaneous, 642. Lake shipments for the week were 45,724 tons, compared with 47,670 for the preceding week.

REACHING OUT.

A special from West Superior, Wis., states that an important railway enterprise with St. Louis and Chicago capital stock back of it has come to light. A newly organized company has for several weeks had surveyors at work running a linc from Superior to Stillwater, Minn., on the St. Croix river. It is the intention of the syndicate interested in the new route to take iron ore at the docks at W. Superior and transport it to barges at Stillwater, thence down the Mississippi to St. Louis, returning with coal. The St. Louis iron manufacturers have concluded that they must draw on the Mesaba and Vermillion ranges for ore. A number of wealthy lumbermen are also said to be interested in the project.

ECONOMY OF FUEL IN FAST VESSELS.

Among the papers read at the summer meeting of the Institution of Naval Architects held in Southhampton, England, was one by a French builder, Mr. J. A. Normand, on the importance of economy of fuel on very fast vessels, Mr. Normand said:

Economy of fuel is universally admitted to be of great importance from a commercial point of view. It has, however, not always been acknowledged as a means of attaining extraordinary speeds. In the cases where very high speeds are to be attained some engineers dispense with steam jackets, feed heaters, etc., in order to save weight, overlooking this important fact that the necessary increase in the weight of boilers is greatly superior to the saving thus effected. When the weight of coal corresponding to an important steaming distance is imposed on trial, as it is, or as it always ought to be, the economy in fuel becomes a sine qua non of success. Economy of fuel is not less important when looked at in regard to the bunker space occupied, and especially to the length occupied in the boat by the machinery and boilers, as well as by the necessary number of stokers to be carried. Between two sets of engines, one requiring six boilers and the other only four, there can be no hesitation which to choose if the reduction may be obtained by making a few simple and practical additions to the machinery. Such differences in the boiler power required, as above mentiond, are not unusual. Taking, for instancef the consumption of my last torpedo-boats, which ranged, according to official trials, from 1-1 lb. of coal per indicated horse-power per hour up to 15 knots and to less than 2 lbs. at 25 knots, this consumption is certainly not more than two-thirds that of a number of similar craft. The total weight of engines and boilers of the boats above alluded to is about 48 lbs. per maximum indicated horse-power, this weight has been still further reduced in the Chevalier, and notably in the Forban, now under construction in my yard. From this it is evident that economy in coal really means economy in weight, on account of the large reductions that are possible in the boiler power. I showed in 1885, and this rule has since been verified in a number of cases, and is now generally assumed to be true, that, in cruisers, torpedo-gunboats, torpedo-boats, etc., if the speed, steaming distance, weight of armament, and general conditions remained unchanged, a reduction in the weight of any part of the ship allows the whole displacement to be reduced by about 4½ times the weight saved. We see therefore that in light war vessels, for instance, any given problem may be solved with widely different displacements, according as the engines are, or are not, economical; in fact, the necessary displacement may be as one to two, according to the weight and economy of the engines, and when extraordinary speeds are imposed exceedingly economical and light engines become a necessity. The remarkable economy of my own engines may be ascribed to several causes, but more particularly to the feed heater. This apparatus, whereby the temperature of the feed may be as much as 240° Fahr, at full speed, gives an economy in fuel consumed of at least 20 per cent. as has been officially proved by comparative experiments on four different boats. The principle of the feed heater, enunciated for the first time in 1856 by my brother Benjamin, is a direct application of the first law of thermodynamics. The heating steam is taken, in compound engines, at mid stroke from the low-pressure cylinder by a special valve, and in triple and quadruple engines direct from the low-pressure casing, all the work previously given up in the engine by the heating steam being a direct gain.

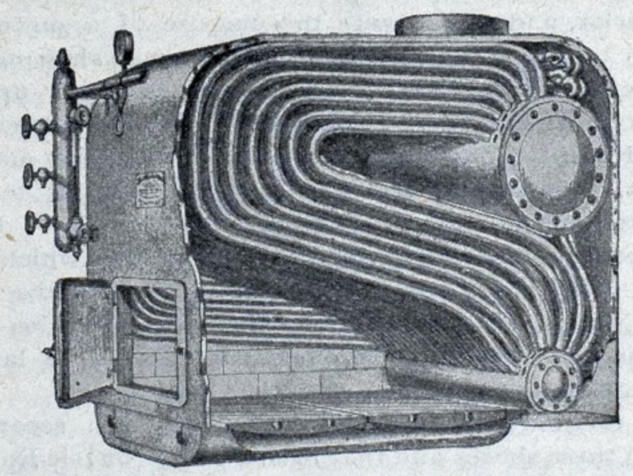
The advantages of the surface feed heater over the injection feed heater seem to be as follows:—(1) The temperature of the steam is not limited to some degrees under 212° Fahr. (2) No particular head or height of the heater above the pumps is necessary. (3) No trouble is experienced with the feed pumps having to pump hot water, as the heating of the feed water takes place under pressure between the delivery of the pumps and the boiler. A great number of applications have already been made by my firm, as also by several other firms, and no practical difficulties have ever been experienced. Indeed, the heater, when provided with an automatic trap, works perfectly, and requires no particular attention. Now, the economy of 20 per cent. above referred to, and which has often been challenged, requires some explanation. It may be ascribed to two causes:—(a) That which results from the number of thermal units saved by using, for heating the feed, steam which has already done work; this may amount to from 10 per cent. to 14 per cent. according to the pressure. (b) That which results from the better circulation of the water in the boiler, a greater proportion of that water being at a boiling temperature.

The upward motion of the water in the heating tube by the bubbles of steam is purely mechanical (as in the "Pohle" air lift pump so much spoken of now), and the resulting increase in the transmission of heat is quite consistent with the well-known experiments described by Ser in his "Traite de Physique Industrielle," from which he draws the following conclusion (Vol. I. p. 227):—"The transmission of heat for the same difference of temperature is more than tripled when the liquid is boiling, which is due to the greater speed in the circulation of the heated liquid." Greater speed in circulation means greater agitation, and the same cause may explain how, by placing baffles in the tubes of my feed heater, the transmission of heat has been more than doubled. (These baffles are removable, so as to allow of the cleaning of tubes.) Whatever may be the true explanation of the economy realized, its existence is beyond all question. On a trial of one of the first-class torpedo-boats the valve of the automatic trap attached to the heater had been left closed, and the heater was not in action; in spite of every possible exertion the revolutions could not be made to exceed 305 per minute. When the error was discovered the feed heater was put into action, and immediately the revolutions rose to 335; but, unfortunately the trial had to be abandoned, as some minutes later some of the firebars fell into the ashpit, on account of the heavy firing that had previously taken place when the heater was not at work. Feed heaters are certainly not the only means of increasing the economy of an engine, but they are probably the most important and the most practical. Their application is easily advantageous to the Navy or mercantile marine.

THE MOSHER PATENT SAFETY WATER-TUBE BOILER.

(ILLUSTRATED).

The change which has taken place and is increasing daily in steam generators for all purposes is worthy of careful consideration, for it practically reverses the conditions which have so long obtained. For years it has been customary to build boilers with huge cylindrical shells and thick plates, loaded down with a large number of stays and socket bolts, merely to enable a very moderate pressure to be carried. This course was necessitated by the type of boiler adopted, the fire-tube. It was assumed that, for reasons unnecessary to recite at length here, no other type would answer, and there are a great many persons who still adhere to that view, but a radical change is taking place and water-tube boilers are fast supplanting the fire-tube. The reasons are plain enough to those who compare both. The water-tube boiler is reduced to the absolute essentials of a steam generator—it consists chiefly of three members only; tubes to contain the water, a furnace to contain the fire and a drum to contain the steam. Opposed to this in the fire-tube is an enormous shell of great weight where high pressures are carried, and braces, hand hole



THE MOSHER WATER-TUBE BOILER.

plates and dead weight without end almost. When we compare the advantages and disadvantages of both types we find that the water-tube boiler has more in its favor than there is against it. It can be brought into service immediately without danger from expansion and contraction; its circulation is perfect, the steam evolved is dry, and the boiler is always clean. It can not be burned so that costly repairs are entailed; if a few tubes are injured through carelessness or neglect they can be renewed at very little expense for time and material, and, what is of the utmost importance in these days of high expansion engines, the water-tube boiler is non-explosive and permits pressures that would be impossible with a shell-boiler of the fire-tube type. As previously remarked, water-tube boilers are increasing rapidly in numbers and in steam yacht service have already supplanted the fire-tube boiler.

The water-tube boiler here shown is the invention of Charles D. Mosher, the well-known engineer and naval architect; builder of the three fastest steam yachts in the world; namely, the "Feiseen," "Norwood," and "The Buzz," renamed "Yankee Doodle." The boiler was designed to meet all the requirements of a light and compact generator, of great power and efficiency, and to withstand the fiercest forced draught and highest pressures of steam. It is specially adapted for use on steam yachts and launches where room and weight allowance are very limited. The engraving shows the design and character of the boiler so clearly that little need be said, a detailed description is hardly necessary. It will be seen that the boiler is virtually composed of only three elements, viz: a steam drum, a water drum, and tubes. The two outer, or back rows of tubes are bent between each other, forming a wall at the back end of the boiler, effectually shielding the casing from intense heat.

These tubes act as return tubes for the downward circulation of the water. The two outer rows of tubes on each side of the boiler are also bent between each other, forming a wall which protects the casing at each side of the furnace. All the other tubes are bent in loops over the furnace, and form the main generating tubes. These tubes are all composed of weldless steel tubing and are perfectly smooth inside and out, and are all expanded into the steam and water drums. There are no joints in the fire and the boiler is perfectly safe against explosion, as the steam-drum is never in contact with the fire, and therefore can not become overheated. The gases of combustion on leaving the furnace, first enter at the lower portion of the tubes at the back end, passing upward and forward among the tubes, being deflected by a baffle plate, then turning and passing back along the upper portion of the tubes, and through the feed-water heater, as shown by the arrows.

The feed-water heater is of the usual construction, being placed in the path of the gases on which they impinge before entering the stack. These boilers have been tested with an air pressure equal to 12 inches of water, without showing the slightest signs of weakness in any part, all joints remaining perfectly tight. The evaporation in a recent test was over 18 pounds of water per square foot of heating surface per hour, and furnishes steam at 250 pounds pressure, having less than 2 per cent. of moisture, as shown by a "Barrus" calorimeter. The Mosher boiler is strictly self-contained, and is specially adapted for portable use, where the lightest and most efficient generator is required, and is now being successfully used for portable engines, steam plows, etc.

The workmanship and material are of the highest class, and is designed for working pressures up to 300 pounds per square inch. For illustrated circular and price list, address the inventor, Charles D. Mosher, 1 Broadway, N. Y.

NOTES.

WHILE the war between Japan and China lasts, the eyes of the naval officers are turned toward the Asiatic station. This is the time, therefore, to have in those waters a fleet of United States war ships which will command the respect of both of the belligerents.

LATE advices from Ottawa, Ont., state that the U. S. Government offer to settle the claims for seizing the British sealers in Bering Sea by the payment of the sum of $425,000. This sum the U. S. Government promises to ask Congress to vote if Canada will accept it. The sum offered is only a little over one half what was originally claimed by Canada as indemnity for the loss sustained by the sealers. The Dominion Government is called upon to inform the British Government whether they will accept the amount offered in settlement for all claims.

CAPT. R. D. EVANS, U. S. N., late naval secretary of the Light-House Board, formally took command of the cruiser New York last week. In this instance the President has set aside the custom of the Navy Department, and given Capt. Evans, who is way down on the list according to rank (his number being thirty-eight) the preference over other officers. Capt. Evans entered the navy as an acting midshipman September 20, 1860. He distinguished himself for bravery in several engagements. At the second assault upon Fort Fisher he was seriously wounded. He was wounded again in another engagement and has been lame ever since. He was made an ensign in 1863, a master in 1866, a lieutenant commander in 1868, a commander in 1878, and a captain June 27, 1893.

"FEW people know," said Frederick S. Safford, of Brooklyn, N.Y., to a reporter, "that the most powerful magnet of which there is any record can be seen at Willet's Point, not far from our city, by any one who takes interest in the marvels of electricity. It consists of two enormous disused guns which some one connected, more for experiment than anything else, with one of the submarine cables. Several thousand feet of cable was wound around the guns which now possess a magnetic power which seems to be entirely beyond anything ever believed possible. If a sledge hammer or a piece of metal is taken near the guns it is drawn to them suddenly and quite a sharp blow is struck. A great many experiments are made with it to test the reliability of demagnetizing works in watches, and altogether it is a scientific wonder which would create a buzz of excitement if displayed at an exposition or in a public place."

WILLIAM L. BROWN, President.
WALTER F. COBB, Vice President and Treasurer.
W. I. BABCOCK, Manager.
O. R. SINCLAIR, Secretary and Asst. Treas.

Chicago Ship Building Company,

STEEL STEAM-SHIP BUILDERS.

101st Street and Calumet River. LONG DISTANCE TELEPHONES: SHIP YARD OFFICE, "SOUTH CHICAGO 40." CHICAGO OFFICE, 1013 ROOKERY, "MAIN 3447." SOUTH CHICAGO, ILL.

Mannheim Insurance Company,

OF MANNHEIM, GERMANY.

CAPITAL, $2,000,000 ASSETS, $3,078,538.22
Deposited in the U. S., $350,000

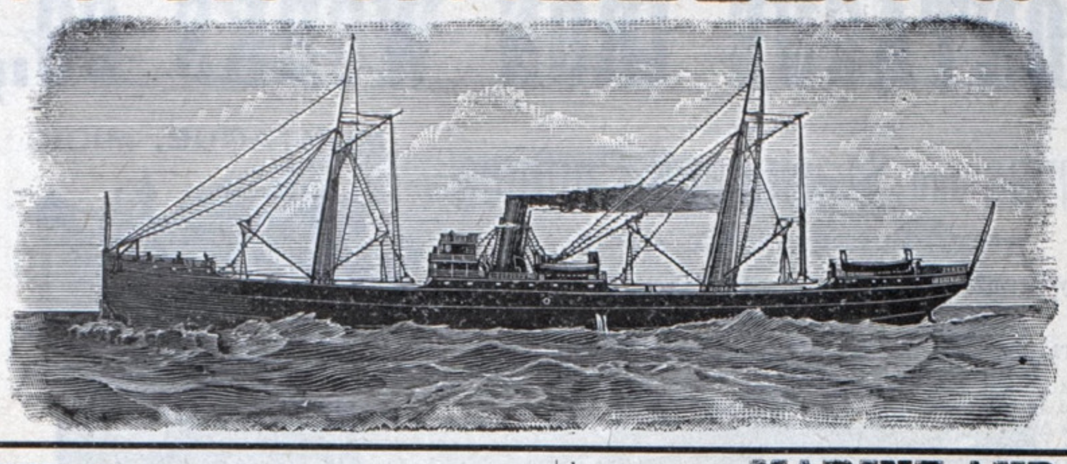
UNITED STATES MANAGER:
Jas. Johnstone Riley, - - New York.

Insures Hulls, Freights and Cargoes.

Marine and Inland Department.

HENDERSON BROTHERS,
General Western Agents,
176 Jackson Street, Chicago, Ill.

F. W. WHEELER & COMPANY.,



BUILDERS OF ALL KINDS OF
IRON, STEEL AND WOODEN SHIPS,
FOR LAKE OR OCEAN SERVICE.
West Bay City, Mich.

F. W. WHEELER, Prest. E. T. CARRINGTON, Vice-Prest.
F. L. GILBERT, Secretary.

INCORPORATED 1794.

Insurance Company of North America.

CAPITAL, Paid up in Cash, - - $3,000,000.00
ASSETS, - - - - - - 9,432,249.80

CHARLES PLATT, President. WILLIAM A. PLATT, Vice-President.
EUGENE L. ELLISON, 2nd Vice-President. GREVILLE E. FRYER, Sec'y & Treas.
JOHN H. ATWOOD, Assistant Secretary.

Lake Marine Department.

GEORGE L. McCURDY, Manager,
CHICAGO, ILLS.

MARINE AND INLAND INSURANCE.

ATLANTIC MUTUAL INSURANCE COMPANY,

(ORGANIZED 1842.) Office, 51 Wall Street, NEW YORK.

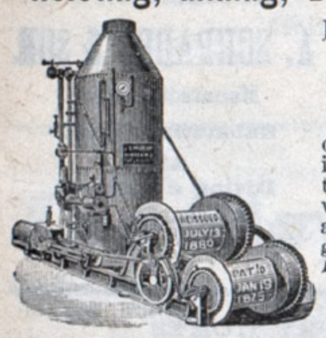
Insures against Marine and Inland Transportation Risks and issue Policies making Loss Payable in England.

Assets over $10,000,000 for the Security of its Policies.

The profits of the Company revert to the assured, and are divided annually upon the premiums terminated during the year; thereby reducing the cost of insurance. For such dividends, certificates are issued bearing interest until ordered to be redeemed, in accordance with the charter.

J. D. JONES, Prest. W. H. H. MOORE, Vice-Prest. A. A. RAVEN, 2nd Vice-Prest. J. H. CHAPMAN, Secy.

Hoisting, Mining, Bridge Erecting,



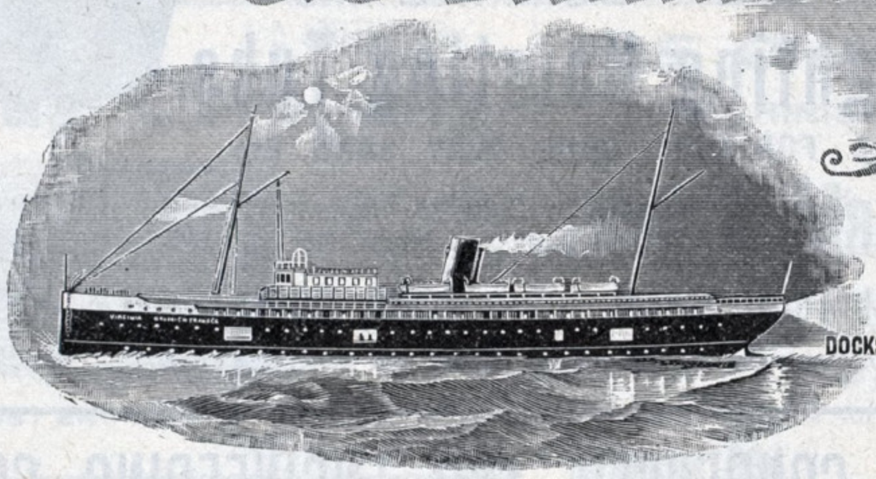
Dock Build'g, Pile Driving, Coal oisting and Quarry Engines

of any power, with my improved Patent Friction Drums, with or without Boilers. Any amount of reference given. Established 1870.
Send for Catalogue.

J. S. MUNDY,
Newark, N. J.

1741 Market St., Philadelphia, Pa.
22 Light St., Baltimore, Md.
117 Water St., Pittsburgh, Pa.
249 South Jefferson St., Chicago, Ill.
715 North Second St., St. Louis, Mo.
39 Magazine St., New Orleans, La.
34 Fremont St., San Francisco, Cal.
85 Front St., Portland, Oregon.
Fourth & Wakouta Sts., St. Paul, Minn.
218 Congress St., Boston, Mass.

E. S. Richardson Fueling Co.



COAL

DOCKS { FOOT OF NORTH MARKET ST. 18TH STREET BRIDGE. ILLINOIS CENTRAL SLIP "C."

Office, 54 LaSalle Street,
CHICAGO.

BUCYRUS Steam Shovel AND Dredge Company,

South Milwaukee, Wis.

STEAM SHOVELS AND DREDGES

For all Purposes.

CAPITAL $300,000.

The Marine Bank Company,

Incorporated in 1891 under State Law. CLEVELAND, OHIO.

Successors to E. B. HALE & CO., established in 1852.

DIRECTORS:

W. H. BARRISS, President. H. C. RANNEY, Vice-President. W. B. HALE, Cashier.
C. E. BURKE. THOS. FITZPATRICK. THOS. H. WHITE. MARTYN BONNELL

Would be pleased to meet or correspond with any one whose present Banking relations are not entirely satisfactory, or who, for any reason, propose to open a new account.

We promise to make every effort to make our Bank a safe, agreeable and profitable place to do business.

MARINE VALVE OIL

FOR CYLINDER LUBRICATION OF THE LARGE STEAMERS ON THE GREAT CHAIN OF LAKES IS UNSURPASSED. : : : : : : :

STANDARD OIL COMPANY, MARINE VALVE OIL CLEVELAND, O.

Marine Valve, Eldorado Engine, Victor Signal, Mineral Seal,
Renown Engine, Crank Case, Dark Lubricating, Head Light,
Arctic Cup Greases, and Lard Oils.

CARRIED IN STOCK AT THE

Standard Oil Company's Marine Depot,

123 RIVER STREET, CLEVELAND, O.

Telephone 77. Main Office Telephone 682.

ALSO FOR SALE BY

STANDARD OIL COMPANY,

No. 5 Wabash Ave., Chicago, Ill.
Racine, Wis.
Broadway and Mason, Milwaukee, Wis.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.
Marinette, Wis.
Oshkosh, Wis.
Duluth, Minn.
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.
Sault Ste Marie, Mich.
Michigan Central Railway and 10th St., West Bay City, Mich.
Eighth and Sears Sts., Saginaw, Mich.
46 Jefferson, Detroit, Mich.
Summit and Monroe Sts., Toledo, O.

STANDARD OIL COMPANY, Star Oil Works, Buffalo, N. Y.
BABY & DALE, St. Clair, Mich.
N. C. ALTEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.
C. H. McCUTCHEON, Buffalo, No. 18 Ohio St.
A. H. McGONAGIL, South Chicago, Ill.
MARINE SUPPLY CO., Fairport, O.
F. KRANZ, Sandusky, O.
THE M. I. WILCOX CORDAGE & SUPPLY CO., Toledo, O.

ATLANTIC REFINING COMPANY, French and 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. McKINNON, Ashtabula Harbor, O.
HULL & RAND Huron, O.

STANDARD OIL COMPANY. RENOWN ENGINE OIL CLEVELAND, OHIO. TRADE MARK

CRANDALL'S PATENT PACKINGS.

FOR STEAM, WATER AND AMMONIA.

Not having been subjected to the injurious chemical action of boiling oil, outlast all others, and never melt and gum. We are constantly displacing other packings on Lake and Ocean Steamers, and can guarantee our goods for marine work. Ask the man offering "the same thing" to explain his process. He boils his goods in oil.

Send for Descriptive Catalogue and Samples.

CRANDALL PACKING CO.

New York, 136 Liberty Street. Chicago, 51 S. Canal Street. Main Offices and Works, PALMYRA, N. Y.

SUMMER TOURS.

The Nickel Plate Road has placed on sale a complete line of tourist tickets to the resorts of the east, including Niagara Falls, One Thousand Islands, Lower Canada, the Atlantic Coast and the mountains of New York and New England. Address B. F. Horner, General Passenger Agent, Cleveland, O., for descriptive matter and full information. 118

MARINE REPAIRS.

Electric power and lights for night work.
Largest steam forge on the northern waters.
Prompt and thorough attention to all work.
Charges low and satisfaction guaranteed.

The Soo City Machine and Boiler Works,

Works on Union Dock. Sault Ste. Marie, Mich.

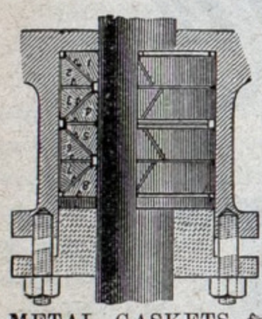
FRANKLIN HOUSE

Cor. Bates & Larned sts., only a block from Woodward & Jefferson aves., DETROIT, MICH. THOROUGHLY RENOVATED. Very central. Per day, $1 50. H. H. JAMES.

PATENTS

Promptly secured. Trade-Marks, Copyrights and Labels registered. Twenty-five years experience. We report whether patent can be secured or not, free of charge. Our fee not due until patent is allowed. 32 page Book Free. H. B. WILLSON & CO., Attorneys at Law, Opp. U. S. Pat. Office. WASHINGTON, D. C.

Katzenstein Self-Acting Metal Packing



for Piston Rods, Valve Stems, Etc., of every description, for Steam Engines, Pumps, Etc. Adopted and in use by the principal Iron Works, Steamship Companies, Mills and Engine Builders, Electric Light and Power Plants within the last twelve years in this and foreign Countries. Also FLEXIBLE TUBULAR METALLIC PACKING for Slip-Joints on Steam Pipes and for Hydraulic Pressure. Also METAL GASKETS for all sizes and shapes of flanges. Double-Acting Balanced Water-tight Bulkhead Doors for Steamers. Also Agents for the McColl-Cumming Patent Liquid Rudder Brake.

L. KATZENSTEIN & CO., General Machinists, Brass Finishers and Engineers' Supplies, 357 West Street, New York, N.Y.

Cleveland Light Guards' Excursion

to Shadduck's Park, Sunday, Aug. 12th. Special train will leave Broadway Depot at 8:30 a. m. Tickets sold by committee. Free admission to the grounds to holders of tickets via the Nickel Plate Road. 129

C. E. BENHAM,

MARINE GROCER

VESSEL SUPPLIES.

121 River St., Cleveland. O.

Goods delivered to all parts of the city. Telephone 745. Detroit, Cleveland, Buffalo and Chicago papers always on hand.

GREATER LORAIN.

To meet the requirements of travel between Cleveland and Lorain, the Nickel Plate Road will increase the present service on Monday, Aug. 13th, by adding one additional passenger train in each direction, leaving Cleveland at 9:00 a. m., returning will leave Lorain at 2:00 p. m. daily, except Sundays. 130

If you are interested in

ADVERTISING,

you ought to be a subscriber to PRINTERS' INK; a journal for advertisers.

PRINTERS' INK is issued weekly, and is filled with contributions and helpful suggestions from the brightest minds in the advertising business.

PRINTERS' INK costs only two dollars a year. A sample copy will be sent on receipt of five cents.

ADDRESS

PRINTERS' INK,

10 SPRUCE STREET, - NEW YORK.

ESTABLISHED 1871. INCORPORATED 1893.

MONTAGUE IRON WORKS CO.,

MANUFACTURERS OF

Marine and Stationary Engines

AND BOILERS OF ALL KINDS.

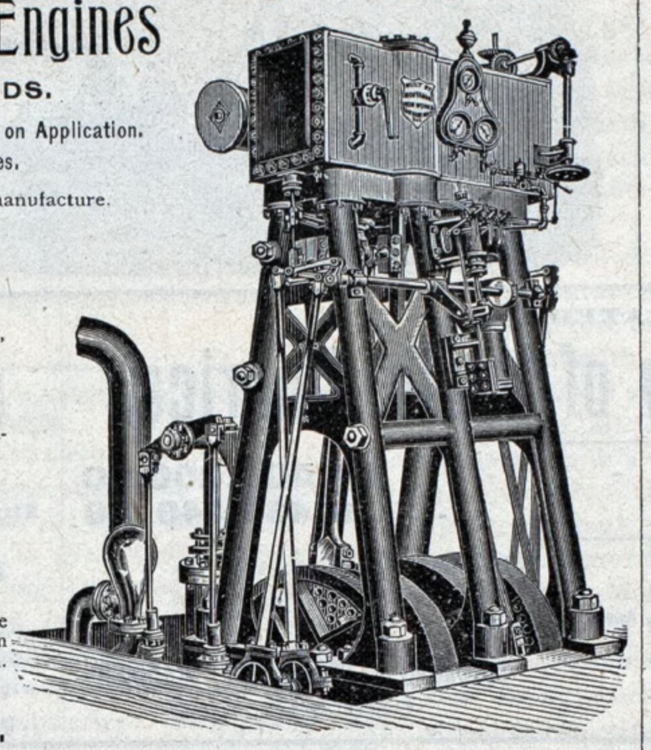
MONTAGUE, MICH.

Heavy Castings a Specialty. Prices Quoted on Application.

Fore and Aft Compound Marine Engines.

The Engines in the ollowing boats are of our manufacture.

Edward Buckley, Manistee, 18 and 36x30.
Sachem, Grand Haven, 21 and 38x36.
Charles A. Street, Chicago, 20 and 36x36.
Isabella J. Boyce, Michigan City, 19 and 32x26.
M. T. Greene, Chicago, 20 and 36x36.
Passenger and Freight Steamer, Mabel Bradshaw, Muskegon, 16 and 28x26.
Ionia, Grand Haven, 24 and 46x42.
Survey Steamer, W. S. Hancock, 12 and 21x20.
Mark B. Covell, Manistee, 18 and 30x26.
Passenger and Frieght Steamer, Bon Voyage, Saugatuck, 16 and 30x26.
Tug, Hunter, Chicago, 15 and 28x22.
Tug, Edward G. Crosby, Muskegon, 16 and 30x24.
Oval Agitator, Chicago, 14 and 28x20.
Tug, Peter Coates, Sault Ste Marie, 10 and 20x16.
Luella H. Worthington, Cedar River, 19 and 36x30.
Passenger Steamer, E. G. Maxwell, Pentwate 14 and 28x20.



The engraving represents our 20 and 36x36 Fore and Aft Compound Marine Engine. We build them all sizes and guarantee them to give satisfaction.

Prices furnished on application.

Montague Iron Works Co., Montague, Mich.

G. L. STUEBNER & CO.

MANUFACTURERS OF

SELF-DUMPING AND

Self-Righting Hoisting Tubs

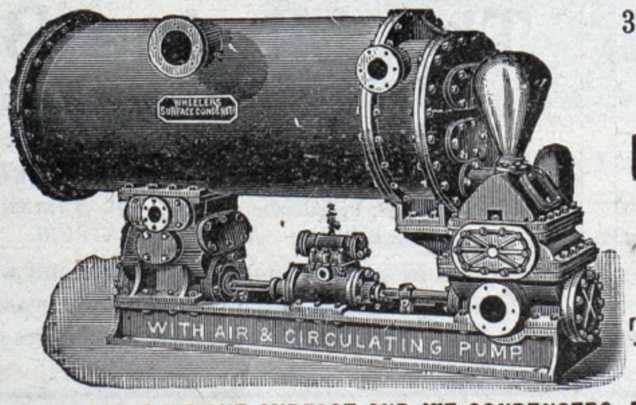
FOR COAL, ORES, CLAY, SAND, Etc.

Side, End and Bottom Dumping Cars, Coal and Coke Barrows, Iron Dock and Hook Blocks, Etc.

168-176 East Third Street, - - LONG ISLAND CITY, N. Y.

ILLUSTRATED CATALOGUE SENT ON APPLICATION.

WHEELER CONDENSER AND ENGINEERING CO.



39 & 41 Cortlandt St., NEW YORK

Proprietors and Manufacturers of

WHEELER'S IMPROVED

Patent SURFACE CONDENSERS

ALSO THE

Wheeler "Admiralty" Condenser,

WITH PATENT SCREW GLANDS.

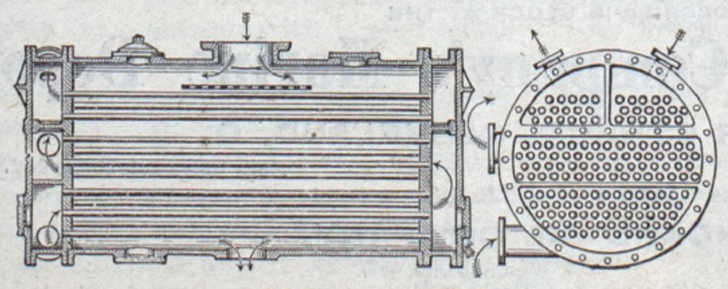
The Wheeler-Lighthall Condenser

With Patent Waterproof Packing.

LIGHT WEIGHT SURFACE AND JET CONDENSERS, FOR STEAM YACHTS, ETC., A SPECIALTY

F. P. BUDDEN, President. W. E. VOLZ, Treas. and Gen'l Mgr.

Standard Condenser Co.,



SOLE BUILDERS

Patent Combined Surface Condenser and Feed Water Heater.

BUILDERS OF

LIGHTHALL

Surface Condensers,

Tube Heads, Patent Brass Screw Glands, Packings, Etc.

CONDENSER REPAIRS.

15 State St., New York.

SEND FOR CIRCULAR.

$2.00 or $1.00

Pays for one year or six months respectively and THE MARINE RECORD gives you all the news of the lakes. Address SMITH & SWAINSON, Leader Building, Cleveland, O.

CENTRIFUGAL

PUMPS for COAL,

SAND OR DREDGING.

Wrecking Pumps a Specialty.

SUPERIOR TO ANY OTHER

16,000 IN USE.

Our Water Ballast Pump will throw more water with less steam than any other. Photographs and estimates on application.

MORRIS MACHINE WORKS,

Baldwinsville, N. Y.

HENION & HUBBELL, Agents,

55 and 57 N. Clinton St., Chicago, Ill.

Have You Heard About

"Summer Outings," descriptive of picnic and summer resorts along the line of the Nickel Plate Road; "Country Home," a list of, open to summer boarders, located on the Nickel Plate Road adjacent to the south shore of Lake Erie; "Summer Tours," an illustrated and descriptive folder of famous resorts in the east; "Red Book," gives routes and rates for summer tours; issued by the Nickel Plate Road? If you desire copies mailed free address B. F. Horner, General Passenger Agent, Cleveland, O. 116

ESTABLISHED, 1844.

A. SCHRADER & SON,

Manufacturers of

Submarine Armor

AND

Diving Apparatus.

32 ROSE ST., N. Y.

Improved Bolt Helmet.

COUNTRY HOMES

Is the title of a pamphlet issued by the Nickel Plate Road, giving a list of places open to summer boarders along the south shore of Lake Erie. Write for a copy. 117

E. G. ASHLEY,

CHOICE FAMILY GROCERIES.

ALSO ALL KINDS OF

Fresh, Salt and Smoked Meats.

Vessel orders attended to day and night. Goods delivered by Steam Yacht "Maggie D."

36 & 38 Summit Street, TOLEDO, O

The most convenient train for the west is the Fast Express via the Nickel Plate road, known as No. 5, leaving Cleveland 11:12 a. m. daily, including Snnday, and stops at Bellevue, Fostoria and Ft. Wayne, arriving at Chicago at 9:35 p. m. Palace Buffet sleeping cars attached. 131

PROPOSALS.

U. S. ENGINEER OFFICE, 34 West Congress street, Detroit, Mich., August 6, 1894. Sealed proposals for Operating Machinery for the 800-ft. Lock, St. Marys Falls Canal, will be received here until 2 p. m., September 5, 1894, and then publicly opened. All information furnished on application. O. M. POE, Col. Corps of Engineers. 32-35

U. S. ENGINEER OFFICE, 34 West Congress street, Detroit, Mich., August 23, 1894. Sealed proposals for furnishing all labor, materials, and appliances, and removing a shoal of bed rock and other material from Sec. 8, Ship Channel between Chicago, Duluth and Buffalo, will be received here until 2 p. m., standard time, September 22, 1894, and then publicly opened. All information furnished on application. O. M. POE, Col. Corps of Engineers. 34-37

IRA B. BASSETT. GEORGE PRESLEY, JR. A. R. TRAIN.

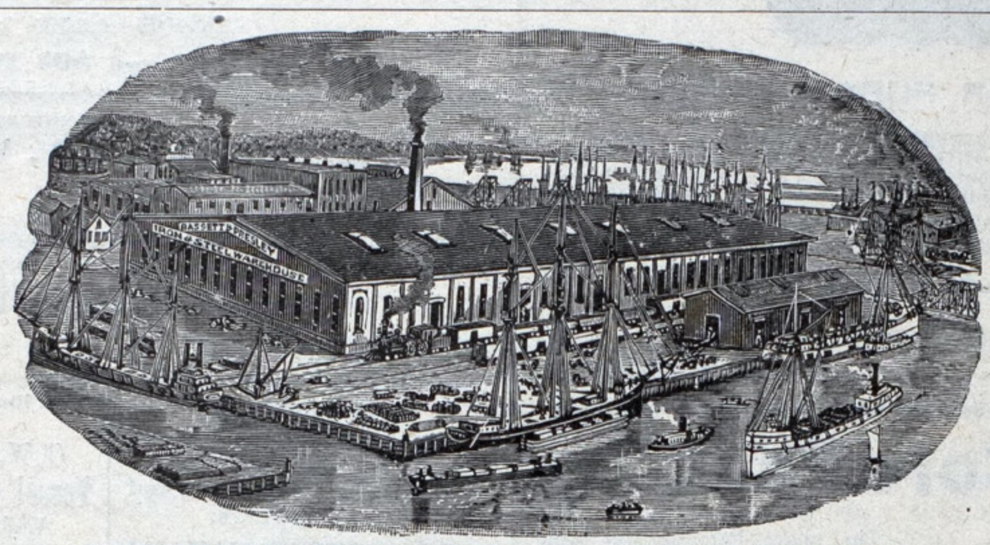
BASSETT, PRESLEY & TRAIN,

Iron and Steel Warehouses.

SHIP PLATES, SHIP SPIKES, ANGLES, BEAMS, CHANNEL AND TEE IRON, BOILER TUBES, BOILER, TANK AND COOPER RIVETS, STEEL BOILER PLATES, BAR, BRIDGE AND CAR IRON, HOOPS, BANDS AND SHEET IRON.

CLEVELAND, · · · · · · OHIO.

WAREHOUSES
17 TO 31 MERWIN ST.
AND COR. ELM AND
HEMLOCK STS.



WAREHOUSES CORNER ELM AND HEMLOCK STREETS.

GENERAL
OFFICES
17 MERWIN
STREET.

BURDEN IRON COMPANY BOILER RIVETS,

THE STANDARD AND ONLY RIVET USED BY ALL FIRST-CLASS BOILER MAKERS IN THE U. S.

Our Correspondents will please note that the Western Union Telegraph Co. s Wires are connected with our Office, and much time will be saved in the transmission and delivery of Messages to us if sent via that Company.

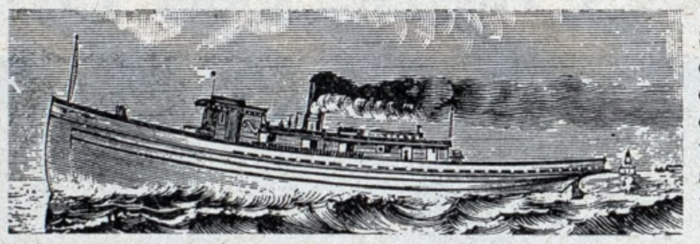
ACME SHAFTING. We own and control the sale of this celebrated brand and carry a full stock of all sizes and lengths. AGENTS FOR THE DIAMOND STATE HORSE SHOES.
Boiler, Bridge and Tank Plates, Nails, Boat and Railroad Spikes, Smoke Stack Rivets, Boiler Patch Bolts, Open Hearth Steel.

ARCHES AND STRAPS FOR VESSELS A SPECIALTY.

H. A. HAWGOOD, Pres't. GEO. ELSEY, JR., Gen'l Mang'r. J. A. SMITH, Sec'y.
PHILIP MINCH, Vice-Pres't. J. R. SPRANKLE, Treas.

The Cleveland Tug Company,

First-class Tugs, Steam Pumps, Divers, Hawsers, Lifting Screws, Etc., furnished Promptly on Orders by Telegraph or otherwise.



Steamers when outsidewanting our Tugs, blow one long whistle and as many short ones as they want tugs.

OFFICE, OPEN DAY AND NIGHT, EAST END MAIN ST. BRIDGE.
LONG DISTANCE TELEPHONE 919. *CLEVELAND, OHIO.*

MULLEN-GATFIELD COAL CO.,

Dealers in the Celebrated

MANSFIELD AND YOUGHIOGHENY COALS.

Docks at SANDWICH, ONTARIO, opposite the Fort at Detroit, with chutes for rapid fueling. Elevated docks and derrick at AMHERSTBURG, ONTARIO.

THE CUDDY-MULLEN COAL COMPANY

DEALERS IN COAL. Docks at Government Pier, Whiskey Island, and Adjoining Globe Dry Dock.

All fully equipped with Revolving Derricks; also, Lighter Carrying Derrick, and One Hundred Two and One-Half Ton Buckets.
Main Office, 81 Perkins Building, East Side of Main Street Bridge.
Dock Office, 127 West River St., Cleveland, Ohio. Telephone No. 8.
Boats Coaled Day and Night. Docks at Amherstburg and Sandwich, Ontario

---

I. H. OWEN, Prest., Chicago. F. H. VAN CLEVE, Sec'y, Escanaba. Capt. GEO. BARTLEY, Supt., Escanaba.

ESCANABA TOWING & WRECKING COMPANY, Escanaba, Mich.

Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks & Diving Appliances always ready.

TUG MONARCH.—Engine Compound, Cylinder 16 & 30 in. diameter, 30 in. Stroke, Steam Pressure allowed, 125 lbs.
TUG DELTA.—Cylinder 20 by 22, Steam Pressure allowed, 105 lbs.
TUG OWEN.—Cylinder 20 by 20, Steam Pressure allowed. 104 lbs.

CENTRIFUGAL PUMPS, SEVEN AND FOURTEEN INCH SUCTION

THE THOMPSON TUG AND WRECKING CO.,

OF PORT HURON.

Have the tugs Merick and Brockway, with lighter Clinton, fitted with McMyler's Improved Revolving Derrick for quick hoisting, stationed at Sault Ste Marie, Mich., ready to do all kinds of wrecking and raft towing.
Address CAPT. ROBERT P. THOMPSON, Sault Ste Marie, Mich.

Tug Chas. D. Thompson, tug building, engine 17 x 36 x 30, are stationed at Port Huron, and are fitted out with a complete wrecking outfit, ready to do all kinds of wrecking and raft towing.
Address LYNN & THOMPSON,
Port Huron, Mich.

THE CHASE MACHINE COMPANY,

MACHINISTS, ENGINEERS AND BLACKSMITHS,

MANUFACTURERS OF

Land & Marine Engines & Steam Pumps,

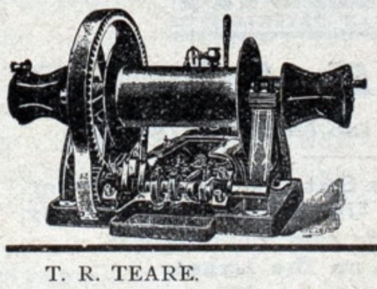
SOLE OWNERS AND MANUFACTURERS OF THE

CHASE AUTOMATIC FOG WHISTLE MACHINE,

IN USE ON NEARLY ALL LAKE STEAMERS.

Agents for ASBESTOS STEAM, BOILER AND PIPE COVERING.

Telephone 994. 111 Elm Street, CLEVELAND, O.



JACKSON & CHURCH,

BUILDER OF DUPLEX HOISTING AND DECK ENGINES.

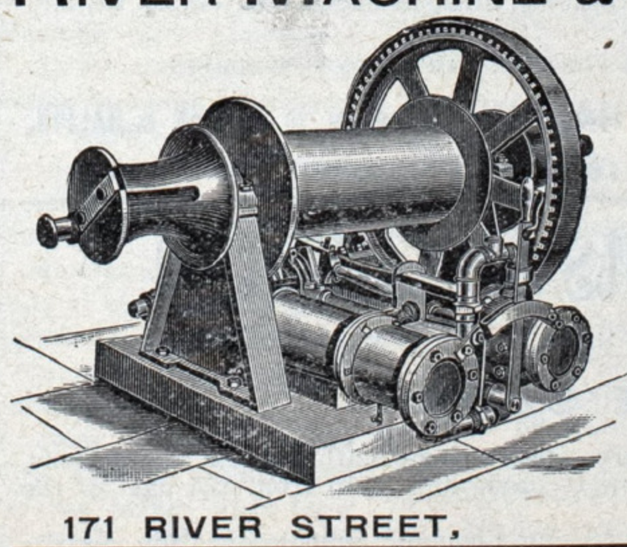
Plain Finished and Automatic **ENGINES,** From Heavy Patterns at Moderate Prices.

Vertical, Horizontal, Marine and Locomotive **BOILERS** Strictly First-Class and Highest Test.

SEND FOR OIRCULAR AND PRICES. SAGINAW, MICH.

T. R. TEARE. M. THOMAS.

RIVER MACHINE & BOILER WORKS



MARINE AND STATIONARY
ENGINES, BOILERS,
. . AND . .
DECK HOISTING
ENGINES.

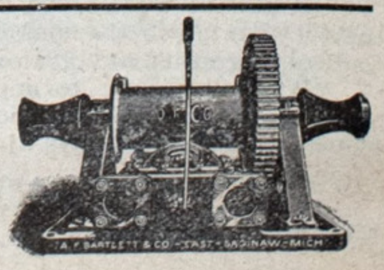
Starting, Stopping, Reversing and Lowering all done by working one Lever.

SOLE AGENTS FOR
St. John's Self Adjusting Cylinder Packing.

171 RIVER STREET, CLEVELAND, O.

BARTLETT DECK HOIST.

In use on the ollowing vessels: Steamers—Roumania, Bulgaria, Germanic, Brittanic, George G. Hadley, S. S. Wilhelm, Majestic, Alex. Nimick, John Harper, Walter Vail, Panther, City of Berlin, City of Paris, City of Glasgow, City of London. Schooners—Tokio, Asiatic, Baltic, Celtic, Aberdeen, William D. Becker. Stopping, Starting, Reversing and Lowering, all done by working one lever.



A. F. BARTLETT & CO., - East Saginaw, Mich.

SERVE'S RIBBED STEEL Boiler and Stay Tubes

Show an average economy in fuel of 15 per cent. In steamers this means not only so much saving in cost of coal or increased power, but additional freight capacity.

☞FULL PARTICULARS ON APPLICATION.

PURVES' RIBBED STEEL BOILER FURNACE FLUE.

With this style of Furnace Flue the rivets at the "back ends" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any other part of the boiler. No smith work is required to fit it in a boiler or to refit it when replaced. It is ready for use as it comes from the manufacturers. This style of flue has been in use six years without a single complaint.

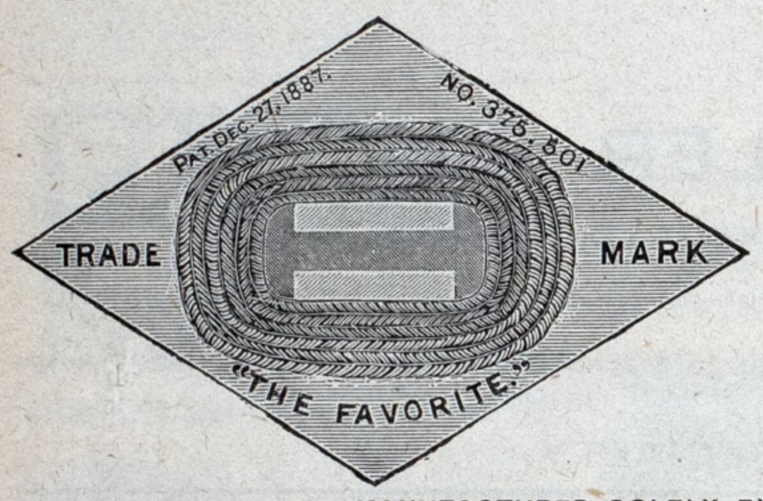
Over 12,000 of Purves' Ribbed Steel Furnace Flues in successful use in Marine Boilers.

CHARLES W. WHITNEY,

Sole Agent for the United States and Canada,

64, 66, 68 BROADWAY, - - - NEW YORK.

The Favorite "T" Core Packing



The above Packing has been manufactured especially to meet a demand for a high-grade Packing for use in high pressure engines.

The cut shows the red and white T core of pure gum. This center being in sections, gives great elasticity, which is permanent, as the core does not vulcanize. The stock is of extra grade flax, solidly braided and thoroughly lubricated.

In boxes for the trade.

Price per Pound, $1.25.

FOR SALE BY ALL DEALERS.

MANUFACTURED SOLELY BY

The American Steam Packing Company,

51 KILBY STREET, BOSTON, MASS.

More or Less?

"Genuine **'Eureka' Steam Packing"** *will* certainly cost *you more than some imitations of it; but, on the other hand, you will require* much less of it. *The only actually* "cheap" *article is the one that yields the greatest amount of service for the money invested. On this basis we claim our* "Eureka Steam Packing" *to be the* cheapest article *of its class now before the Engineers of America.*

Send for sample to ***HINE & ROBERTSON,*** No. 5.
Engineers are invited to write for our Prize List. **Cortlandt St., New York.**

THE "WELLS LIGHT"

WALLWORK & WELLS' PATENTS. (Registered Trade.)

2000 CANDLE POWER.

Especially adapted for DRY DOCKS AND NIGHT LOADING.

Portable. Requires no Outside Motive Power.
Entirely Self-Contained. Unaffected by Weather.
No Spray, No Smoke, Safe and Economical.
In Use on 15 Dry Docks on the Lakes.

Also adapted for IRON AND STEEL HEATING. For Hull and Boiler Plates, Tubes, Bending, Straightening and Laying Up Work.

FOR FURTHER PARTICULARS, ADDRESS

WILLIAM HALPIN, Successor to KEEGAN & HALPIN,

45 AND 46 WASHINGTON ST., NEW YORK.

Simple Elements of Navigation.

BY LUCIEN YOUNG, U. S. NAVY. POCKET-BOOK FORM.

PRICE $2.00.

"This is a treatise on Navigation free from abstrue mathematical calculations, yet comprehensive enough to teach how to navigate a ship from any part of the globe to another.

"It can be understood by any one having a common-school education, and its instructions as to the means of finding latitude, longitude, courses and bearings, and solving other navigation problems, are both simple and accurate.

"Without giving formulæ, it supplies all the rules and tables necessary for working out a ship's position, and it also contains a large amount of information concerning charts, buoys, lights and other aids to navigation."—*New York Herald.*

SMITH & SWAINSON,

LEADER BUILDING. CLEVELAND, O.

MARINE AND INLAND INSURANCE.

SUN INSURANCE COMPANY

SAN FRANCISCO, CAL.

INLAND MARINE DEPARTMENT, CHICAGO, ILLS. R. E. RISPIN, MANAGER, 6 AND 8 SHERMAN ST.

C. A. MACDONALD & CO.,

GENERAL MARINE INSURANCE AGENTS.

RIALTO BUILDING, CHICAGO, ILL.

THOS. WILSON,

MANAGING OWNER WILSON'S TRANSIT LINE,

General Forwarder, Freight and Vessel Agent. CLEVELAND, O.

C. R. JONES & CO., VESSEL AGENTS

FIRE AND MARINE INSURANCE.

Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.

MITCHELL & CO., Vessel and Insurance Agents,

Office Telephone, 767. 508-509-510 Perry-Payne Building,
Residence John Mitchell, 3506. CLEVELAND, O.

M. J. GALVIN. CAPT. ALEX. CLARK. JOHN C. FITZPATRICK.

GALVIN, CLARK & CO., Vessel and Insurance Agents.

TELEPHONE SENECA 892. NO. 60 MAIN STREET, BUFFALO, N. Y.

ESTABLISHED 1857.

THOMAS MARKS & CO.,

Merchants, Forwarders and Ship Owners.

PORT ARTHUR, CANADA.

N. B.—Special attention given to chartering vessels.

C. W. Elphicke. A. L. Fitch. Jas. A. Myers.

C. W. ELPHICKE & CO., Vessel Owners and Agents,

MARINE UNDERWRITERS.

6 & 8 Sherman St., CHICAGO,
Rooms 10, 11 & 12 Wheeler Block.
Telephone 1194.

A. A. Parker. James W. Millen. B. W. Parker.

PARKER & MILLEN, Vessel & Insurance Agents.

Iron Ore & Coal Cargoes a Specialty.
Rooms 3 & 4 15 Atwater St., West.
DETROIT, MICH.

Calvin Carr. G. C. Blair. John Mitchell.

CARR & BLAIR

VESSEL AND INSURANCE AGENTS,

Rooms 1 and 2. Tel. Main 869.
12 Sherman St. CHICAGO.

Marine Reporters. Vessel Agents.

HARVEY'S MARINE BUREAU,

THOS. R. HARVEY, Mgr.
Sault Ste. Marie, - Mich.

C. E. BENHAM,

VESSEL AND

Insurance Agent,

613 Perry-Payne Bldg.
Telephone 170. CLEVELAND, O.

C. T. Palmer. H. W. Cook. Capt. J. A. Calbick.

Palmer, Cook & Calbick,

Vessel Agents and Underwriters,
8 and 109 Royal Insurance Bldg.
Chicago, Ill.
Telephone, Harrison 698.

J. G. Keith. D. Sullivan.

J. G. KEITH & CO.

VESSEL AND INSURANCE AGENTS,

140 and 141 Rialto Bldg. CHICAGO.
Telephone No. 3658.

JOHN PRINDIVILLE,

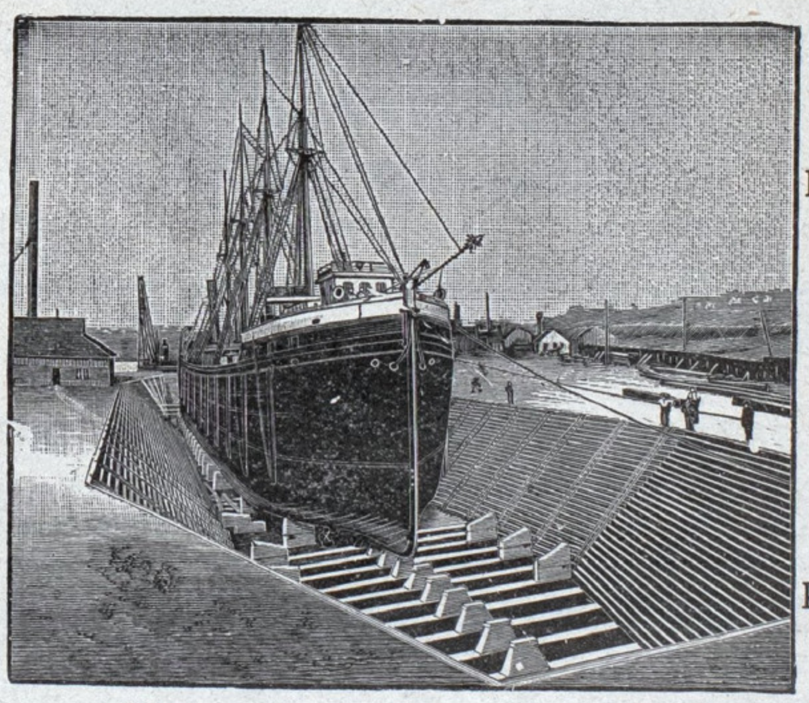
VESSEL AND

INSURANCE AGENT,

12 Sherman Street,
Telephone Main 129. CHICAGO.

THE SHIP OWNERS DRY DOCK CO.

OLD DOCK
Length of Keel Blocks 340 ft.
Width of Gate 50 ft.
Depth of Water on Keel Blocks 16 ft.

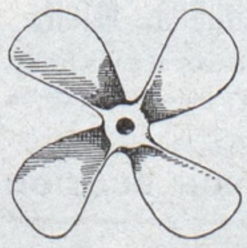


NEW DOCK
Length of Keel Blocks 300 ft.
Width of Gate 52 ft.
Depth of Water on Keel Blocks 14 ft.

GENERAL REPAIR WORK PROMPTLY ATTENDED TO.

Being equipped with Lucigen Lights we can do work at night as well as day.

TELEPHONE 1635. Foot of Weddell St., CLEVELAND, O.



McKINNON MANUFACTURING CO.,

BOILER MAKERS, FOUNDERS AND MACHINISTS,

Marine Boilers, Engines and Ship-yard Machinery. Most Powerful set of Hydraulic Slings on the Lakes. Best Towing and Speed Propeller Wheels made. Send us a trial order.

Works and Office, 224-230 N. Water St., BAY CITY, MICH.

SWAIN WRECKING CO.,

Tugs { FAVORITE AND SAGINAW.

Telegraph { PARKER & MILLEN, Detroit, Mich. Capt. M. SWAIN, Cheboygan, Mich.